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IMPRESSIONS AND IMPRESSION TAKING.

By Mr. F. Molloy.

Mr. President and Gentlemen,—The subject of the paper I am about to read before you this evening, is one, the importance of which, in my opinion, is not realized by the majority of students. Even if it were, existing arrangements in most dental hospitals, make it impossible for them to become expert in taking impressions or bites, and adjusting artificial dentures. To put it briefly, a gap exists between mechanical and surgical dentistry, which neither the workroom training, nor the hospital practice seems to bridge. Latterly, however, the London dental schools have appreciated this fact, and by giving students opportunities to make themselves practically acquainted with the details of operations, must to some extent, at any rate, have overcome what seems to me the only defect in our dental education.

Commencing with the various materials in use for taking models of the mouth, I believe beeswax to be the oldest on the list, speaking of modern times, for I have no wish at the present, to speculate as to the kind of material used by the ancients. The evidence, given by the alleged discovery of gold plates in the mouths of mummies, ought to prove that

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* Read before the Students' Society, Victoria Dental Hospital, Manchester

they took impressions in those days, unless indeed, following up the tale of their method of filling teeth with molten lead, some might be induced to wonder whether dentures were struck up to the mouth direct.

Beeswax then is oldest as far as I can make out, and I suppose must have served its purpose fairly well as long as it was without a rival. Its chief drawback is that it is of too soft a consistency to harden in the mouth as much as would be desirable before removing the impression, which results in what are termed drags, chiefly at the necks of teeth, and the posterior part of the palate.

The material now most extensively used by the profession is a combination of substances varying in proportions, according to the ideas of individual manufacturers, and is universally known as composition. Two names which are almost synonymous with the last are "Stent" and "Godiva," these being the terms applied to the best known makes. Their proportions, as I said before, may differ, or other substances may be added, but mainly the constituents of composition are, I believe, stearine, gum kouri, French chalk and colouring agents. The advantages of composition are numerous, and its defects few. At this point, however, I may mention that it is at its best after a short period of use, as when too new it has a great tendency to contract, and consequently detract from the accuracy of the model. It becomes very soft in hot water, and hardens rapidly in the mouth. It secures a sharp impression, and its only remaining drawback is that yielding slowly as it does, the necessary pressure sometimes displaces the soft parts of the mouth.

Gutta-Percha is another modelling material. Owing to its elasticity it takes undercuts well, but the length of time required to soften it, and its sticky consistency, have prevented its obtaining favour to any large extent.

Plaster of Paris is acknowledged to be the most perfect material known for taking impressions. It is, however, inconvenient and also objectionable for frequent use, but in edentulous cases, cleft palates, and where the parts are very soft, it is the only really suitable material.

Coming now to the operation of taking the impression, the first, and what I consider the most important step, is the selection of a tray or carrier which is adapted to the requirements of the case. Neglect in this matter will only necessitate a repetition of the operation, and in some cases even the remake of the artificial work dependant on the model.

A dentist cannot possess trays in too great number and variety, in order to obtain the best results and make the ordeal as light as possible for his patients. It is necessary now and then to make a special tray for an unusual case, generally a high or cleft palate, and for lower jaws where the remaining teeth stand particularly high and the alveolus is very much absorbed. I do not think many of the profession heed the statement made by a well-known dental authority, that a special tray should be struck up for each case undertaken. This rule would fall in very well perhaps with the ideas of those gentlemen who never use the same composition twice, and certain others who profess to clean and fill every root to its apex. The notion of a carrier or tray for applying and removing impressions seems to be only of comparatively recent date, for I understand that in the earlier part of the century, the wax was merely pressed up round the teeth by the hand and held there sufficiently hard to be removed. Then came the idea of carriers which were made at first of earthenware. It was not long before this gave place to metal, sheet tin and pewter, for instance. The bright-looking plated articles now manufactured of German silver are no doubt very nice as regards appearance, and the facility with which they can be cleaned, but they have not the advantages possessed by those made of pewter and Britannia metal, which being soft can be bent or altered to suit any particular case without loss of time.

The tray having been selected, the next thing is to fill it with the material chosen. In the case of composition or gutta-percha, it should be placed in a basin and softened with boiling water. When the composition is soft it should be kneaded with the fingers and folded over and over on itself, in order to get rid of creases, and to give it a cylindrical form. This must be done rapidly before it becomes at all stiff, and the tray being dipped in the hot water to make the composition adhere, the cylindrical roll should be placed in its groove and moulded up with the fingers to the shape of the gums, and the depth of the palate as near as can be judged from the remembrance of the mouth.

All this time the composition must be kept soft by frequent immersion in the water and if all superfluous material be removed from the borders and the back of the tray,and trouble be taken to mould the composition in the way described above, clients will look upon the operation of "taking the mould," as they call it, with feelings of amusement instead of with thoughts of being choked.

Fellow feeling makes us wondrous kind. I have had the impressions of my own mouth taken more than once, but I shall not easily forget the momentary fright I experienced when my mouth was filled up with what seemed to me a gigantic tray, filled with an enormous amount of composition. For a few seconds I felt as if about to suffocate and a feeling of helplessness and inability to speak added greatly to my discomfort. However, that passed off, when I found I could breathe fairly well, and as I became used to the unaccustomed performance. To continue however ; having got the tray and composition ready and moulded properly, it is usual to heat it slightly over a spirit lamp flame, this being supposed to give a sharper impression. The patient being requested to open the mouth to the fullest extent, one corner of the tray should be introduced first, then the other, in order to avoid unduly distending the cheeks. Once inside the mouth, intimate at once to the patient that the mouth must still be kept open or in most cases they will close their jaws, whether with the idea of facilitating the operation or from a strong desire to relieve the strain, I know not. Before pressing the tray up or down as the case may be, take care that you have it exactly in position over the gums, that is to say, not too much to one side nor too far forward. Want of care in this respect will show itself at once upon pressure, by the patient's indications of pain. On removing the tray you will find that the metal palate not being properly in position the composition has become displaced and the hard metal has been pressing upon the gum. This is one case. A more common one is where the outside borders of the tray have pressed deeply into the soft tissues on the buccal or labial sides of alveoli. The impression should always be pressed up first at the back, being pulled also slightly forward to get the rugæ sharp and distinct and then held firmly in place with one hand, whilst the other is occupied in pressing the composition round the outside border of the gums. In edentulous cases it is advisable not to remove the impression until the composition is perfectly hard ; but where many teeth are standing it should be removed whilst it is sufficiently yielding to come away without difficulty. Upon the removal of an impression from the mouth it is usually placed in cold water to prevent contraction. In the case of patients who are inclined to vomit it is well to make the business as short as possible, and this may be done by syringing the impression whilst in the mouth with cold water.

Turning our attention to plaster, before inserting it in the mouth it is sometimes necessary to give the patient an alkaline mouth-wash to get rid of that viscid mucous saliva which in some subjects is quite thick enough to interfere with the correctness of the impression. This in my opinion even applies to composition, but must certainly not be overlooked in the case of plaster, otherwise the result will be an uneven messed-up surface and the model would have been more reliable had it been taken in wax.

Plaster is sometimes used with an ordinary tray with scratched lines to give some hold. The more usual method is that of taking an impression with composition and then having cut away a certain amount of it, the tray is then filled with plaster, this reduces the amount of plaster to be used to the minimum, and if the case contain many undercuts, breakage may be secured in the desired places by building out those parts of the tray with wax, which will have the result of thinning the plaster where the wax is fullest. Upon removing the impression from the mouth the thin layers easily snap and the separate pieces can be replaced in the tray and the model will be practically as perfect as if it had come out in one piece.

Referring generally to all kinds of impressions, a difficulty is sometimes experienced in removing them from the mouth owing to suction. In this case request the patient to cough slightly. The effort will elevate the soft palate letting the air between, rendering the removal no longer difficult.

To conclude, an impression should always be removed from the mouth with very little pronounced motion in any direction. It should be brought vertically up or down as the case may be ; but should it require force to loosen it patience should be exercised or the result will be considerable dragging or an enlarged model.

I thank you, gentlemen, for your kind attention and await with interest your criticism of the ideas embodied in my paper.

INAUGURAL ADDRESS.*

By Mr. F. W. Minshall, L.D.S. Eng.

Gentlemen,—It was with somewhat mixed feelings that I accepted the position to which you have been good enough to elect me, though I gladly admit that the chiefest of these is one of satisfaction and pleasure that you have sufficient confidence in me to entrust to me the occupancy of this chair for the session; and whilst sincerely thanking you for so doing, and promising to do my utmost—with the generous help I shall no doubt receive from my fellow members of your council—not to allow that confidence to be entirely misplaced, still I cannot hide from myself the fact that you have strayed dangerously far away from the principle of according "honour to whom honour is due."

Amongst the reasons and forces which have contributed in placing me in my present position, there are two to which I should like to refer. The first, with which you are all familiar, is a pretty general belief that I am not very badly afflicted with "cacoethes loquendi" and this is a great consolation in excusing, if not justifying, the brevity of this address,—and I am painfully aware also that to-night I stand between you and a more interesting and a more important communication.

The other reason can at present be only known to what Theosophists call your "sub-conscious selves" and in laying this before you I am compelled to ask your indulgence in a wearisome iteration of the first personal pronoun. Your late President in the graceful remarks he made in resigning into my hands the gubernatorial reins of this Society, made some modest allusions to his and my juvenility, which, in regard to myself, were more generous than just and strictly accurate. You have this year, for the first time in the Society's history, elected as your President one who retired from active practice a quarter of a century since. Lest this statement should be received with incredulity, I must ask your forbearance whilst I explain how it was that about 25 years ago I made and fitted my first tube central incisor. My father's dentist at this period of what is unfortunately fast becoming ancient history had a double reputation—the one as a skilful dentist and the other and less creditable one for his ability to consume large quantities of alcoholic stimulants. It so happened that during one of his dentist's attacks of dipsomania, my father had the misfortune to break a tube central off the plate he was wearing, leaving the gold plate and pin very conspicuous Then it was that I was permitted by means of a pocket-knife,an old file, and a drill made from a knitting needle to carve a tooth from the ivory handle of an old table knife, and by attaching it to the plate with shellac to rescue an indulgent parent from an unpleasant dilemma. After carrying this operation to a successful issue, it is, I think, fortunate that, instead of being allowed to blossom out into all the glories of a brass plate, I was retired from practice and compelled to devote my attention again to the construction of very ungrammatical sentences and the solution of abstruse but elementary arithmetical problems.

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* Read before the Students' Society, Victoria Dental Hospital, Manchester.

Notwithstanding the incident just related it would be presumptious on my part and going quite beyond my province to-night were I in any sense to attempt to "lecture" you, still it is both customary and seemly that I should offer for your consideration a few thoughts upon a few subjects connected with the profession of which, let us hope, we are one and all students. The science and art of dental surgery being of necessity chiefly confined within narrow limits, is also mainly concerned with operations which are in themselves minute and delicate, and it behoves us at all times to devote careful attention to the smallest and apparently most unimportant details, and it is to some of these details which do not "*per se*" affect our ability to prepare and fill carious cavities, or extract offending molars, that I propose to allude to for a few minutes.

One of the first and most important of these matters is to *secure* and maintain the completest confidence of our patients, and perhaps the second is to *deserve* it by refusing at all times to be guilty of deceit in our treatment of them—whether old or young—and if it be indeed true that "the voice of the people is the voice of the deity," then one can hardly resist the belief that in the past—whatever they may be in the future—dentists have been "deceitful above all and desperately wicked." Probably in no circumstances is the foolishness of deceit (to use no stronger term) more plainly demonstrated than in the treatment of nervous and refractory children when taken for the dentist to "cast out a devil" in the form of an aching tooth. What parents expect the moral result will be of taking a child to the dentist with a positive promise that the tooth shall not be extracted and when there saying "now he's not going to take it out, open your mouth and show the gentleman which it is," and then in a "stage whisper"—generally loud enough for the patient to hear—saying to the dentist, "Take it out, and say nothing about it," had better be left to the parents to explain, but of the practical result even those of us who have not yet commenced private practice have probably a very decided and unfavourable opinion. Restraint, even forcible restraint, may sometimes be necessary and unavoidable, but deceit never.

Then again, if on a small scale our work is most varied in character both on the operative and mechanical side, and however good and perfect the training of a student may have been during his hospital and college career, and however familiar he may be with the broad general principals which will guide him in his work, he is almost certain during the exigencies of private practice to be called upon to perform some operation which he has never yet heard of, and it is therefore essential to a dentist that he has good inventive faculties, and to use a parodox, should possess considerable *ability to do the undo-able.*

Again the question of strict cleanliness, both of instruments and the person, is of very grave importance, and not only ought we to indulge in the luxury of soap and water very frequently, but the lavatory should be so placed that our patients may not only suppose but see that our hands have been well washed before commencing an operation, but also during it, if for any reason we have occasion to leave the chair-side.

The question of recreation has not, so far as I am aware, been touched upon by any of my predecessors in this chair, yet this is also a most potent element in the life of a dentist, for while skill at golf, tennis, or cricket will not teach us how to build up a gold contour filling, and well developed muscles will not suffice to restore the worn out bur, still the maintenance of health will tend to reduce the cruelty of hesitancy in painful operations. Furthermore, the possession of a "hobby" say for painting and drawing, modelling, wood carving, etching or engraving, (which may be indulged in in a climate like ours when out-door exercise cannot always be engaged in with pleasure as well as profit), will be found of much value; we may derive considerable satisfaction and enjoyment therefrom, and at the same time be attaining that dexterity and training of the hand which it is so essential we should acquire and which can never be so well acquired as in early life. Some little portion of our spare time devoted to these latter pursuits would doubtless have a good effect in rendering impossible and unknown those fearfully and wonderfully clumsy and unnecessarily ugly dentures which are a disgrace to 19th century dentistry.

Now, gentlemen, I desire to express my thanks again for the honour you have conferred upon me after so short a membership of your Society, and for the patient way in which you have listened to my remarks ; my sincere wishes for the continuance and prosperity of the Society, and a fervent hope that, while every member may in the future obtain that reward for his studies and services to which he is legitimately entitled, you will none of you ever consider, (as two recent advertisers in the Dental Journals did), that your chief qualifications are that you are either "Keen at forcep work," or "Good fee-getters," and in conclusion, allow me to point out two matters upon the dark side of the profession of your choice, the first having reference to this world, and the second to the next. Mr. Ruskin has laid it down as an axiom that a gentleman "never intentionally causes pain" to a fellow being, hence if you are successful dentists, I fear you will never be *gentlemen* ; and, worse still, I once heard a lady, who had recently had a number of teeth extracted, piously and fervently ejaculate at a private dinner table, "Thank goodness there are no dentists in Heaven."

CARBOLIC TOOTH POWDER.

Acid. Carbolic	ʒss.
Sodæ bicarb.	℥iss.
Pulv. pot. chlor.	ʒss.
,, sacch. alb.	℥ij.
Cretæ præcip.	℥xij.
Ol. caryoph.	♏viij.
Ol. rose-geranii	♏viij.
Ol. limonis	♏xv.
Terra rosa vel carmine	q. s.

ON THE DISINFECTION OF CHILDREN'S MOUTHS.*

By JULIUS HARTMANN, Dentist, Münster.

It is well known how exceedingly difficult it is to get children to rinse out their mouths, and especially to gargle. In time of need, namely, in the numerous diseases of the oral cavity, and especially of the throat and larynx, this is unpleasantly manifest, as well for the parents as for the little patients, and not least, also, for the doctor.

I have endeavoured to help in this bad condition of affairs and sought to supply a substitute more agreeable for rinsing and gargling, and that literally upon the principle :—*Utile cum dulci.* The means which seems most suitable for disinfecting the mouth is Thymol, which is very efficacious in weak solutions (1 in 3 or 4000) without being poisonous. The greatest drawback to Thymol is its bad taste. But oil of peppermint conceals this taste, and is itself an antiseptic not to be despised. This led me to the idea to introduce peppermint pastiles which contain Thymol. A further antiseptic is lemon juice, which is particularly recommended in diphtheria. Pastiles prepared according to the following prescription have quite an agreeable, refreshing taste, and my children take them gladly.

R.	Sacchar.	gramme 200.0
	Ol. Menth. pip.	1.0
	Thymol	.2
	Spirit abs.	2.0
	Succ. Citr. adde fruct. vanillæ.	
M.	Ft. Rotulæ 400	

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* Translated from *Deutsche Monatsschrift fur Zahnheilkunde.*

If one wishes to sweeten the pastilles a little more one can add a small quantity of Saccharin. One can even make up 100 grammes Saccharum with ·3 or ·35 of Saccharin, especially in adults. In this way the dose of Thymol is doubled if one makes the Rotulæ ·5 grammes in weight as above.

The formula must then be :—

R.	Sacchar.	100
	Saccharin	·3—·35
	Thymol	·2 etc. as above.
Fiant Rotulæ		200.

It is therefore taken that Saccharin is 280 times as sweet as sugar.

If these pastilles, then, are made ·5 gr. in weight (the Rotul. Menth. pip. sold by the apothecary are about this weight) the doctor can arrange, according to the age and constitution of the patient, the dose of Thymol to be taken; he will only need to say how many Thymol pastilles are a dose, which must be slowly dissolved in the mouth.

The presence of sugar does not interfere with Thymol, as no fermentation or acid formation takes place. I have had a one-tenth per cent. solution, in water, of the Thymol-Sugar-Peppermint mixture standing in an open vessel since July, and to-day (Sep. 14th), while I write this, it is entirely unchanged, as I have myself ascertained.

The mouth and throat of children, as well as of adults, can easily be disinfected by means of these Rotulæ so long as the patient can swallow the saliva in which the pastilles may slowly dissolve. I am firmly convinced that the Thymol pastilles have great prophyllactic value in diseases of the mouth, throat, and even perhaps of the whole intestinal tract.

A Berlin apothecary, who is well known for his preparation of specialities of the so-called *Pharmacopœa elegans* welcomed my idea, and has made up my prescription in a somewhat changed form, granulated. It is, however, an easy matter for any apothecary to make a preparation from the above formula, and I may point out that, as the composition shows, this method has the advantage of being so very cheap that it may be employed to the widest extent.

NITRATE OF SILVER IN THE TREATMENT OF ROOT CANALS.

By C. T. Stockwell.

I am experimenting, thus far successfully, with its use in the treatment of putrescent pulp-canals. We have a class of molars where, for various reasons it is nearly or quite impossible to reach the apex of one or more canals with the desired thoroughness and certainty. In short, all we can do is to do "the best we can." These are the cases that suggested to my mind the nitrate of silver treatment.

With the rubber dam in place, I introduce into the chamber and carry as far as possible into the canals, a strong solution —fifty per cent. and upward—of nitrate of silver, afterwards sealing in the chamber a pledget of cotton saturated with the same, and let it remain for a day or two. Then fill as successfully as possible with such material as circumstances indicate. The object, of course, is to thoroughly sterilize the desired territory, and I have a theory that the action of the drug upon the dentine and the contents of the canals and tubuli is such that we have permanent antiseptic condition.

International.

British Journal of Dental Science.

LONDON, JANUARY 1st, 1894.

REFLECTIONS.

The commencement of a new volume of the JOURNAL reminds us that we should, for a moment, look backwards and take what pleasure we can from the retrospect of the past twelve months. The index, of course, enables us to refer to subjects upon which detailed information may be required, but we now pass in review one or two of the more general topics which interest us in the field of Dental Science, Politics and Practice.

This time a year ago we were publishing correspondence upon the subject of the "warning" against covering issued by the General Medical Council. As was to be expected, opinions differed; but, so far as we know, matters have now settled down, and, as we recorded in our last issue, the first case for consideration was presented at the recent session of the Council. Later on came the action taken when the Council found themselves in a dilemma as to the recognition of foreign diplomas. The decision arrived at gave rise to some angry remarks, but it must be regarded as only a just one by all those interested in the British Dental Student, who is compelled to undergo a five years' curriculum after a preliminary examination in general knowledge.

The Dental Congress held at Chicago is doubtless to be regarded as one of the events of the past year. A large gathering of dentists and the presentation of many excellent papers should certainly result in good. The hospitality extended to visitors was itself a distinguishing feature, and although we still occasionally come across slight references to a misunderstanding as to "invitations," we trust the matter is not serious enough to be borne long in mind.

Turning homewards once again, we may notice the paper read by Mr. Hopewell Smith, at the November meeting of the Odontological Society, upon the Dental Pulp. It is an instance of what we may expect at the hands of the rising generation of dentists, a body scientifically trained, ready to emulate the good work of the best of their immediate predecessors, and well able to utilize the advantage gained by a steadily improving education. All this is matter for congratulation; and when we reflect upon the activity displayed at the various Schools, the continued success of professional journalism at home and abroad, and the increasing recognition of our social status, we are prepared to meet any charge of indulging in an undue optimism.

We may modestly assure our readers that no effort shall be wanting to do our share in promoting professional interests. Whilst endeavouring, in the year just closed, to keep readers posted in ordinary matters, we have occasionally stepped outside the more limited field to draw attention to subjects likely to be useful or interesting, such as The Adulteration of Food, or the peculiar disease known as Acromegaly. Such, and kindred topics, have a bearing, though perhaps not at first apparent, upon the practice of our special branch of the Healing Art. We hope shortly to publish the translation of an important series of observations upon the connection of the Diseases of the Eyes and Teeth.

DENTAL APPOINTMENTS AT HOSPITALS.—A correspondent writes to us with a grievance. He wished to be appointed Honorary Dental Surgeon to a Cottage Hospital, and has been offered the post of Consulting Dental Surgeon. Many would consider the latter the more honourable position, but perhaps our correspondent is anxious for active work. We have no fault to find with the rules of the Institution which apparently place great power in the hands of the Medical Staff; and we cannot help thinking L.R.C.S.I. made a mistake in not first ascertaining the wishes of the Staff, instead of offering his services to the General Committee. The reason assigned by the Staff for not accepting such services, that he would be entitled to beds, is a poor one, and it seems to us that whilst not wishing to have our correspondent as an active colleague, perhaps too active as an *ex officio* member of Committee, they are willing to meet the suggestion of the General Committee by a compromise. We do not think our correspondent will do much to cultivate the good feeling to which he alludes, by making references to modes of practice and the question of fees. If, as he seems to think, professional dignity is at such a low ebb, we should suggest that he might retain his own by declining the offered post, and thus satisfy all the parties concerned.

HÆMORRHAGE FROM TUMOUR OF THE PALATE.—Mr. J. A. Milne describes, in the *British Medical Journal*, a case which gave him some trouble. A soldier had severe bleeding from the mouth which he could not stop. He said there was a small lump on the palate and that a hard piece of toast had scratched it. Examination showed a large clot, from behind which blood continually streamed down into the pharynx. Under the clot was a tumour the size of a pea, and from the margin the blood was coming fast. All the ordinary styptics were tried, including nitrate of silver and strong perchloride of iron. Ultimately the actual cautery, at ten minute intervals, completely stopped the hæmorrhage. As the growth was almost entirely removed by this treatment, its exact structure could not be ascertained, but it was thought to be a soft papilloma and to account for this unusual form of hæmorrhage in the mouth.

Diseased Meat.—Until we become vegetarians the conditions under which we obtain our pound of flesh are of the utmost importance. It is lamentable to think that, in the face of what we know about tuberculosis, some more stringent precautions are not taken. According to a return of the Board of Agriculture our meat supply for 1892 was 2,122,000 tons. Now, it is well known that Jews are very careful in their system of slaughtering, and from another return of the animals thus prepared at the Foreign Meat Market and other places, it is found that only seventy-three per cent. of the oxen and sheep were pronounced fit by the Jewish slaughterers. The *British Medical Journal* allows that a portion of this per centage may be accounted for by what are termed technical blemishes, but thinks that at least ten per cent., 212,000 tons, of the meat actually sold is either positively diseased or unwholesome. It recommends the entire abolition of private slaughterhouses, and cites, as a model, the Melbourne Act, under which a sanitary officer has only to prove that any part of an animal is tuberculous in order to secure the destruction of the carcass.

Interesting Cases.—At the Pathological Society, Dr. F. T. Paul reported the case of a boy, aged five years, who was born with an irregular patch of skin on the cheek near the inner corner of the eye. Five months before he came under observation a tooth erupted at this spot, surrounded by a little rim of red gum-like tissue. There was also a second, smaller, tooth beneath the first. Neither of them was connected with the superior maxilla. The dental arch was well formed, all the normal teeth being present. At the Plymouth Medical Society, Mr. A. Rendle showed a case of Macroglossia in a female child sixteen months old, the tongue and mouth were both large; the dorsum of the former was especially thickened, but was withdrawn into the mouth during sleep. At the Sheffield Medico-Chirurgical Society, Dr. Davy exhibited a plate with artificial teeth which had been passed per anum. At the Torquay Medical Society, Dr. Pollard showed microscopic sections from a case in which he removed, with the écraseur, an epithelioma from the side of the tongue in a man aged fifty-three. Four years after the operation the patient is apparently free from disease.

FACIAL HEMIATROPHY.—At the Berlin Medical Society, Professor Mendel showed a patient suffering from this condition. She was sixty years of age, and generally enjoyed good health. About twelve months before, she experienced an emotional shock and was then seized with intense pain in the right side of the face. Five months later there were yellow patches along the course of the branches of the fifth nerve on the same side, and the right half of the patient's face has gradually undergone complete atrophy. The tongue and muscles supplied by the motor fibres were not affected. The Professor pointed out that the condition is generally due to interstitial neuritis but in this case the rapid disappearance of sensory troubles seemed to indicate that the atrophy must be ascribed to a different cause. There was also no disturbance in the secretion of sweat as is usually observed.

ARTIFICIAL TEETH FOR CONVICTS.—A daily paper has given a somewhat romantic account of the way a convict obtained an artificial denture. He had been sentenced to a long term of penal servitude for defrauding his employers. He had also neglected dental precautions, an omisssion which brought its own punishment, and, finding that he could not deal satisfactorily with the prison fare, applied to the governor of the prison for some artificial teeth. We are ready to believe that it was a personal matter, and that he was not attempting to agitate for the appointment of prison dentists. The Governor's reply, however, bears upon this point, and we have already had to chronicle the fact that in the case of a lady prisoner a tooth-brush even was not allowed. Our convict was told that the Government did not supply artificial teeth. He thereupon wrote to the bankers he had defrauded offering to tell something to their advantage if they would provide him with what he required to enable him to masticate. They responded with five pounds and have recovered £1,500, besides receiving a remittance of a sovereign from the prison authorities, for the teeth cost only £4. We wonder if they have been "guaranteed" for the prisoner's term of servitude.

A Challenge.—During the discussion at the Alabama Association, upon the best methods of striking up plates, Dr. Crawford suggested that, at the next meeting, Dr. Freeman and himself should each make a metal plate. He would use a Babbitt's metal, and Dr. Freeman zinc and lead, each of them taking an impression of the same mouth. The plates could then be tested on the cast, and in the mouth, for accuracy of fit. Dr. Freeman expressed his willingness to accept this challenge, and ventured to assert in advance that whilst his opponent's production might fit the cast, his own would fit the mouth more perfectly. He advocates the reliable old-fashioned die and counter die of zinc and lead, and says it is a well-known fact that the expansion of plaster and the contraction of zinc mutually counteract each other, and thus result in a most accurate fit.

Review.

Diseases and Injuries of the Teeth, including Pathology and Treatment. By Morton Smale, M.R.C.S., L.D.S., and J. F. Colyer, M.R.C.S., L.D.S. London: Longmans, Green, & Co., 1893.

This book is intended as a manual of practical Dentistry for Students and Practitioners, and as both the authors have been engaged in the instruction of the former class, and are also attached as Dental Surgeons to General Hospitals, we may imagine that they are fully competent for the task they have undertaken at the request of the publishers. In the preface we note some changes in the usually accetped no menclature, dependent upon the substitution of the term "mandible" for "inferior maxilla." In the Introduction a new feature, in connection with such works, is introduced in referring to the treatment of patients. The questionof fees may seem to some a peculiar point to raise in a work upon Dental Surgery, but the authors doubtless felt that this was a fitting, and perhaps the best, opportunity to put their views on record. The tone of their remarks leaves little room for criticism, and it would certainly make for good if the course of conduct recommended could be carried out by town and provincial dentists alike. "The surgeon does his best whether he takes a large or a small fee, and if he considers his services of more value than the small fee offered, he refuses to take the case and recommends a junior practitioner. At once and for ever the principal of arranging fees upon the question of the number of teeth in a denture, and whether the same are mounted on gold or vulcanite, or whether gold or plastic fillings are used, should cease, for this system is good neither for the profession, nor the public, nor the dental surgeon." Whilst we may all agree at least with the quotation from Ruskin that the stipend is a due and necessary adjunct, but not the object of life, yet we are afraid that the time has not come when our authors' recommendations will be fully acted upon. We must, however, admire them for having the courage of their opinions in thus pointing out the direction to be taken in order to cultivate the true professional status.

The main body of the book before us consists of twenty-three chapters, and the arrangement of the different subjects leaves little to be desired. There is, throughout, a system of classification which, by its clearness and absence of undue complication, should materially assist the student in following the various questions treated upon. The treatment of the temporary teeth fairly covers the ground, and stress is properly laid upon the necessity for constant supervision and early remedial attention. The authors are in favour of devitalisation by arsenic in appropriate cases, and also of rhizodontropy. The useful application of a small elevator in extracting fragments of temporary teeth is mentioned, but it seems almost too much of a refinement to insist upon two pairs of forceps, one for each side, for the upper molars. In connection with the irregularities of the permanent dentition there are excellent diagrams to illustrate the manner in which teeth move when space has been made by extraction. The authors are sound upon the question of symmetrical removal of teeth, and favour the treatment by extraction as against the use of plates. The use of fixed apparatus as practised in America is condemned, the authors not taking the trouble even to point out a frequent objection, due to the necessity of raising the bite which some of the said devices ignore.

The account given of Caries is,naturally,brought up to date; whilst the sixty pages devoted to its treatment forms a distinct feature of the work. There are numerous diagrams to elucidate the text upon the preparation of cavities and the introduction of filling materials. Much of Chapter VIII, dealing with the Dental Pulp, would prove instructive reading to the general medical practitioner, who, however, would probably have to stop short of root canal filling. The operations of amputating apices of roots, of transplantation and of implantation, do not meet with support from the authors. It is not an easy task to write an accurate and readily understood description of the handling of instruments, but the operation of extraction is here well done, and is a part of the book useful for general practitioners. In the following, the word "blade" probably takes the place of "root" by mistake. "In removing molars it is best to loosen the palatine blade first, and to employ loosening movement first inwards so as to disengage the roots from the external alveolus, and afterwards downwards and outwards in the axis of the internal root." Although we think we know what is meant, this sentence would perhaps be a little clearer without the second "first," or else it should be made plain that the buccal roots are loosened simultaneously with inward pressure on the palatine one, and then the first "first" should be deleted. Perhaps this and a few typographical inaccuracies which we have noticed, will receive attention in the next edition. The book, which is well printed on good paper and of convenient size, has over 300 illustrations, mostly original; and is appropriately brought to a conclusion with a useful chapter on Diagnosis of Swellings about the Jaws, followed by an Index.

Anæsthetics and their Administration. By Frederic W. Hewitt, M.A., M.D. London: Charles Griffin and Company, 1893.

This book is intended as a manual for Medical and Dental Practitioners and Students, and is one of Griffin's scientific text-books. It is extremely well written, and represents the results obtained from special notes collected by the author for ten years. The increasing literature upon the subject of anæsthesia almost leads to the belief that it must prove difficult for a new work to show much originality, but one of the most marked features of the book before us consists in the presentation to the reader of short clinical records of the various stages during actual administrations. The introduction of black dots showing the various conditions of the pupil, in some of the illustrative cases, adds to the graphic style. The information imparted being of a clinical and practical character, there are no detailed references to the discovery and history of the various anæsthetic agents. The author is a recognized authority upon the use of gaseous mixtures, and his remarks upon this part of the subject are therefore very valuable. Without going through a detailed account of the book, we may say that it thoroughly covers the whole ground. Some time ago we drew attention to the author's ingenious modification of Junker's inhaler, which is here illustrated in addition to all the other usual apparatus.

Abstracts of British & Foreign Journals.

CONCERNING VARIOUS METHODS ADVOCATED FOR OBVIATING THE NECESSITY OF EXTRACTING DEVITALIZED TOOTH PULPS.

By W. D. Miller, Ph.D., M.D., D.D.S., Berlin, Germany.

It is not the object of this paper to discuss the methods of either Herbst or Bœdecker. They do not inspire me personally with great confidence, but I should not wish to dissuade any one who may feel so inclined to make trial of them, though it seems to me that we have nearly all been trying them, *nolens volens* for many years. I have for a long time laboured under the impression that the solution of the problem was to be sought for in the direction first pointed out by Witzel in 1876, with the exception that our efforts should be directed not to retaining the vitality of the root stumps, but to preventing their subsequent decomposition by impregnating them with a suitable antiseptic. I am convinced that the success of the impregnation method depends to a very great extent upon the character of the antiseptic employed and upon its chemical action upon the pulp apart from its antiseptic action. The qualities desirable in a substance which is to be employed for the purpose in question appear to me to be the following: 1. It must be a strong antiseptic. 2. It must be sufficiently soluble and diffusible to guarantee the impregnation of the whole pulp. 3. It must not be so diffusible that it will be completely taken up by the surrounding tissue and finally disappear altogether, as is the case with applications of carbolic acid. It is my impression that there is greater danger in too great solubility than in insolubility. 4. A coagulating action upon the tissue of the pulp appears to me to be desirable, though it may not be absolutely essential. A pulp which is coagulated into a hard, insoluble body is less likely to furnish nourishment for bacteria, and less likely to offer irritation to the periapical tissue than one in a soft or semiliquid condition. I am inclined to think that one cause of the failure of Baume's borax treatment is the fact that the pulp becomes converted into a liquid or semiliquid soapy mass with a strong alkaline smell and reaction, which I hardly think can be indifferent to the tissue about the apical foramen.

5. It is desirable that the substance employed have no irritating action upon the pericementum either at the time of application or subsequently. 6. It should not discolour the tooth, although as the treatment concerns chiefly molars, a slight discolouration need not be considered as a very serious matter. 7. Solid substances are better adapted to the purpose than liquids.

We shall see that it is about as difficult to find a substance which fulfils all the above-mentioned conditions as it is to find one that fulfils all the requisites of a perfect filling material. My investigations relating to this subject were begun in 1888, and the results of over 500 experiments reported in the *Dental Cosmos* for August, 1890. Full details of the methods employed will be found in the article referred to. I may here state in brief that carious teeth freshly extracted, whose pulps were not already putrid, were opened with a large bur, and the coronal portion of the pulp removed. The antiseptic to be tested was applied to the stumps, covered with a layer of tin foil (in practice gold foil is preferable), and the cavity filled with cement. The teeth were then planted in agar-agar and put into the incubator. After a given time, sometimes days, sometimes weeks, the teeth were removed, split open and the pulp taken out and placed upon plates of agar-agar already infected, which were then placed in the incubator to await development. In all cases where the pulps had taken up the antiseptic in appreciable quantity, it would be indicated by a corresponding lack of the development of bacteria in their neighbourhood. Experiments were also made on calves' pulps in the tooth as well as in glass tubes, on dogs' teeth, etc.

According to the results obtained, I have divided dental antiseptics into three groups:

1. Those which possess in a high degree the power of imparting antiseptic qualities to root pulps, such as cyanide of mercury, bichloride of mercury, diaptherin, shlphate of copper, salicylate of mercury, oil of cinnamon, ortho-kresol, carbolic acid, trichlorphenol, chloride of zinc. The last four are, however, decidedly inferior to the others; they penetrate the pulp very rapidly, chloride of zinc surprisingly so, but they are lacking in the necessary powerful antiseptic qualities and are furthermore so diffusible that they, in the course of a few weeks, disappear altogether from the pulp. 2. Those of doubtful value. Thymol, salicylic acid, eugenol, camphophenique, hydro-naphthol, L and B naphthol, acetico-tartrate

of aluminium and some essential oils, resorcin, thallin, sulphocarbolite of zinc, oil of birch, iodide of sodium, nitrate of sodium, etc. 3. Those nearly or quite worthless: Iodoform, basic aniline colouring matters, borax, boracic acid, dermatol, europhene, chloride of lime, peroxide of hydrogen, sozoiodol salts, iodol, tincture of iodine, spirits of camphor, naphthaine, etc., etc.

The grouping of these substances may be surprising to some, in particular the designation of the peroxide of hydrogen as being worthless for the purpose under consideration. But it must be borne in mind that the peroxide of hydrogen in a root canal, loses its antiseptic action in a very short time, and while it may make the portion of the pulp with which it comes in contact, aseptic, it does not make it antiseptic, and besides its action is confined to the surface.

The attempt to apply these results to practice was first made with the bichloride of mercury, which has been used since 1890, in some 400 or 500 cases. It was first employed in the form of small tablets having the composition:

	1.	Sublimate ...	0.01 grams.
		Boracic acid ...	0.02 ,,
Or			
		Sublimate ...	0.01 grams.
		Common salt ...	0.02 ,,

The pulp having been completely devitalized, the pulp chamber was thoroughly opened and cleansed, and a tablet applied and slightly crushed with an amalgam plugger, moistened with water and covered with a layer of tin foil (I now use gold foil), and the amalgam or cement filling immediately inserted.

In about 30 per cent. of the cases severe pain occurred on the day following the application, sometimes accompanied by intense soreness and swelling, which, however, subsides completely in a day or two, and in no case resulted in suppuration. I can attribute this effect only to the action of the sublimate upon the pericementum. Carbolic acid too freely used in the treatment of root canals *sometimes* brings about a similar condition. On account of this disagreeable symptom these tablets were abandoned, and the following substituted:

2.	Sublimate ...	0.0075 grams.
	Thymol ...	0.0075 ,,

These are applied in the same manner. The thymol being chiefly designed to prevent the sublimate being so rapidly absorbed, besides giving a greater permanency to the application by reducing its solubility. Very seldom, so far, has pain followed the use of these tablets, while experiments out of the mouth show that they still possess sufficient penetrating power.

Another combination employed is :

3.	Sublimate	...	0.005 grams.
	Thymol	...	0.005 „
	Tannin	...	0.005 „

This combination is somewhat empirical, though the design of the tannin will be apparent to every one. The combination does not penetrate as rapidly as No. 2, and discolours the tooth more. Cyanide of mercury has also been employed in combination with thymol in the following form :

4.	Cyanide of mercury		0.0075 grams.
	Thymol	...	0.0075 „

Also the salicylate of mercury in the same form. This, I think, is deserving of a trial. Its sparing solubility justifies the belief that its action will be more permanent than that of sublimate. The salicylate is at present used in the treatment of syphilis ; large doses being injected once a week, and serving as a depot from which it is slowly and gradually taken up by the system. The sulphate of copper may be used in pure form, but it naturally causes serious discoloration of the tooth at the neck. It is also, I fear, too soluble to give permanent results in pure form. More recently I have directed my experiments toward the discovery of some substance which possesses the desired qualities without discolouring the tooth. Thus far I have obtained the best results from diaphtherin (oxychinaseptol), an antiseptic recently introduced by Emmerich. It may be applied in pure form. Among liquid antiseptics the oil of cinnamon takes the first place, and I have much faith in its power to conserve the dead pulp. Like all the liquids, however, it is difficult to apply and has the disagreeable quality of discolouring the tooth yellowish brown.

The combination which I have chiefly employed is that of sublimate and thymol. (I have not had opportunity to sufficiently test the others in practice, though I am now using by way of experiment the salicylate, and to some extent the cyanide of mercury.) It has been employed at the Denta

Institute of the University of Berlin, in over two hundred cases. Of these only one failure has come to my knowledge, that of a right lower molar in which secondary decay had appeared around the filling two years after the treatment, exposing the application. The tooth was sensitive to percussion, and caused pain in masticating. I place no reliance, however, upon these data, because it is impossible to keep track of cases in a clinic, and some of the teeth may well have been extracted without my knowledge. A colleague of mine who treated ninety cases between '89 and '93, was obliged to extract two teeth after fifteen and eighteen months respectively. One of these teeth he kindly sent me for examination, which revealed a gangrenous pulp, as well as the fact that the pulp chamber had not been opened up at all (the case being difficult of access), so that this case should be deducted from the failures. Traces of the tablet found in the cavity of decay still showed antiseptic properties. Another colleague treated thirty cases, with one failure; a third, over one hundred cases, with no ill effects except discoloration. I, myself, have treated but six cases in my private practice, all of which are in perfect order at present. I attach as little importance to these statistics, however, as I do to statistics of this nature in general. Some of the most worthless methods ever introduced to the profession have been ushered in with statistics showing 100 per cent of success. Not that the authors of them were insincere, but the statistics themselves deceptive. Time is the only test for methods like those under consideration, and we can scarcely expect to arrive at a definite conclusion in less than five or ten years. Nor should we be hasty in the application of methods of this nature. One or two cases every month, at least for the first year or two, is all that a careful dentist ought to risk in private practice. Cases should be chosen which are very difficult to treat, and which are otherwise frequently treated by the forceps, such as distal cavities of second or third molars, buccal cavities of third molars, etc. It is not possible at present to form a reliable estimate as to the value of this method of treating teeth; it may also be that much better materials will be found for the purpose than those suggested above. There are, at least, reasons for believing that by a careful application of this method, many teeth may be saved which otherwise would be sacrificed to the forceps, or, what is much worse, be allowed to crumble away.—*The Dental Review.*

SARCOMA OF THE TONSILS, THE VELUM PALATI AND BASE OF THE TONGUE; EXCISION; RECOVERY.

By Professor Verneuil.

On October 12th, 1893, I operated on a young man, aged 18, for a primary malignant neoplasm on the left tonsil which had infiltrated the neighbouring parts, viz., the corresponding anterior pillar of the fauces, the velum palati and the base of the tongue. The presence of the tumour which had attained the size of a small lemon had only been discovered two months previously but the affection was evidently of longer duration, and the tumour had probably existed for at least a year. It gave rise to comparatively slight functional troubles; respiration was practically normal but deglutition was interfered with, while the voice had a nasal twang and there was some difficulty of speech.

The neoplasm was removed by a sub-maxillary incision, similar to that advocated for partial resection of the lower jaw in connection with a method of operation which formed the subject of a communication to the Chirurgical Society by Dr. Maunoury (Chartres) in 1878. The first part of the operation consists in making an incision from the labial commissure along the edge of the inferior maxilla to the angle of the jaw. All the soft parts are divided, with the exception of the mucous membrane, so as not yet to open into the buccal cavity, the facial artery being at once secured and ligatured. In the second stage a free incision is made below jaw and the hyoid bone, the submaxillary and lymphatic glands being excised *en bloc*, after ligature of the lingual artery and even of the external carotid, if necessary. The buccal cavity is then opened into with or without partial resection of the inferior maxilla, and the wound being kept wide open with forceps, free access is obtained permitting of the easy removal of the intra-buccal neoplasm.

This was the method I employed. The external carotid having been ligatured I succeeded in detaching the tumour from the bony palate, removing at the same time the diseased anterior pillar of the fauces. The incision was prolonged to the base of the tongue transforming the neoplasm into a pedunculated mass lying free in the buccal cavity. The operation was completed by dragging the tumour through the sub-maxillary incision. The intervention occupied forty minutes. To facilitate alimentation I endeavoured to introduce an œsophageal tube into the patient's stomach but without success, the attempt being followed by emesis of about a tumblerful of blood and mucus. As a matter of fact, the operation was attended by moderate hæmorrhage in spite of the ligature of the principal arteries of supply so that we are enabled to form an approximate idea of the quantity of blood which would be lost in such cases were this preliminary precaution neglected. The hæmorrhage was especially severe from the wound in the base of the tongue, but immediately ceased when the lingual wound was sutured. The patient made an uninterrupted recovery, and by the eighteenth day all traces of the intra-buccal operation had almost completely disappeared, the gap in the roof of the mouth being reduced to about the size of a shilling. The voice had lost its nasal twang and there was no escape of food into the nose. On microscopical examination by Dr. Clado, the neoplasm was found to be a small-celled sarcoma.

In concluding I wish to say a few words as to the post-operative treatment which I have shown to be one of the principal factors of success, in such cases, my opinion being based on a number of cases of permanent recovery in which no relapse has recurred ten, twelve, or even fifteen years after the intervention. As an illustration I may mention among other cases that of a lady on whom I operated twelve years ago and who was kept under treatment without interruption for six years thereafter. She has had no relapse and is now in the enjoyment of excellent health. The method of post-operative treatment to which I am referring consists in the administration of a combination of arseniate of soda and magnesia.

The Medical Week.

Dr. KILLIAN treats root canals with iodoform vapour, by filling the root with iodoform and passing a heated platinum instrument into it, which, he says, vapourizes the iodoform and this acts as a disinfectant. Apyly the platinum several times until all iodoform is vapourized, then fill root canal.

BUCCAL ANTISEPSIS.

According to Dr. P. Unna (Hamburg), the buccal cavity is most efficaciously disinfected by cleaning the teeth with a brush thoroughly impregnated with powdered chlorate of potash. Needless to add that the mouth should then be repeatedly rinsed with water.

Employed in the manner above described chlorate of potash is said to exert a powerfully antiseptic action in virtue both of its bactericidal properties and of the free secretion of saliva and mucus produced, which effectually clears the mouth of particles of food as well as of mucous and epithelial *debris*. The operation produces a cool sensation in the mouth which extends to the tonsils and pharynx like the antiseptic action of the salt in question. It restores the purity of the breath in cases of fœtor and it is an excellent prophylactic against infectious sore throat and diphtheria. The application of powdered chlorate of potash to the healthy buccal mucous membrane is unattended by any pain but it becomes painful when the membrane is eroded or ulcerated, as for example in cases of mercurial stomatitis. But the pain is not very severe and only of short duration ; moreover it serves as an indication of the presence of buccal lesions which might otherwise escape detection, The pain rapidly disappears if the application of chlorate of potassium to the teeth and mouth be continued, this substance being the most efficacious remedy at present known for mercurial stomatitis. If for some cause or other the patient objects to the use of pure chlorate of potash, the latter may be replaced by a paste composed of a mixture of prepared chalk, iris powder, soap and glycerine, to which 50 per cent of chlorate of potassium is added.

Chlorate of potash should only be employed as a tooth powder by adults on account of the risk of intoxication which may arise from the salts being swallowed by children.

The Medical Week.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

At the Meeting on Nov. 6th, 1893, the following discussion took place on Mr. Smith's paper, on the Dental Pulp, published in our last issue.

Mr. F. J. Bennett said the members would probably all take one view in expressing their approval and admiration of the specimens exhibited, and of the arguments which had been brought forward in their explanation. No doubt, together with Mr. Hopewell Smith, they had all experienced a severe shaking in their views and convictions on the subject of odontoblasts within the last few years. Different methods had arisen, and different explanations had been given in these matters. He, with many others, was very much surprised to hear the very free remark recently made by Mr. Tomes, for it seemed as though they would have to learn their work all over again. That must not be regretted in the least degree; in fact it would go on as long as there was anything to be discovered at all, and they must all try to bear an open mind for the reception of new ideas. He was not sure whether the author had mentioned the method employed in the preparation of the specimens, but he believed that he was right in considering that they were not done by the Weil process.

Mr. Hopewell Smith said that they were all prepared by his own method.

Mr. Bennett would have been glad to hear a more detailed description of the method by which it was done, because a great deal, if not everything, depended upon the way in which the specimens were prepared. The diagrams, together with the specimens exhibited, showed something more than the natural structures of the pulp. He thought they showed a certain amount of shrinking, so that they represented not the actual condition that existed in the pulp but also the effect of chemical treatment, producing shrinkage. He therefore disagreed with the statement that there was no alteration in the structure owing to the addition of chemical reagents, and believed that there was evidence of alteration. With regard to the impossibility of bi-functional activity in the same cell, it might be true that there was not more than one activity in a cell, but there was more than one condition. It was constantly found that cells not only performed their function, but that in the process of age and degeneration their nature was altered. Therefore, when they saw the odontoblast, which had its processes passing into the dentine, they must remember that there might not only be some function for the soft portion of the cell, but besides that an appearance of a calcification which, although not a function, was a second condition. They might, therefore, say with regard to those specimens, that it would be possible to assume that the odontoblast cells had the function cf sending processes into the dentine, but that in the presence of degeneration they became subject to calcification, and that calcification of part of the body of the cell resulted in the hard structure of the dentine. This was not an original idea, but it was one idea which might be entertained, and as they found in osteoblast cells, this was the idea generally received—that it was a calcification acting upon an originally circular cell, or a cell without processes, and that the processes were produced by the actual encroachment of calcification proceeding from without inwards. So he submitted that they might have the analogy of the osteoblast cell still to lay hold of, to consider that the hard structure was formed from the odontoblast cell. Mr. Hopewell Smith had been candid enough to allude to the difficulties that had to be got over in assuming that any nerve structure, or structure of epiblastic origin, could arise from mesoblastic elements. He had been very fair in that, because to his (Mr. Bennett's) thinking, it was a very formidable obstacle. He had also been kind enough to point out that no connection could be seen between the central termination of the odontoblast and any nerve whatsoever, although it might be assumed. He would therefore go away with the idea that he had seen processes entering the dentine in a better way than he had ever seen them anywhere else, but that the theories upon which these were based, still remained in doubt.

Mr. W. A. MAGGS said the author had not referred to Dr. Sudduth's theory, that dentine is a secretion of lime salts under the superintendence of the odontoblasts. He maintained that the odontoblasts preside over the calcification of dentine, and are not themselves converted into dentine ; that the calcified matter is deposited around the dentinal fibrils and as it is deposited the odontoblast cells recede, hence dentine is tubular, and by the fusion of contiguous tubules, a solid mass is formed, which is commonly termed the "matrix." The author had said that the cells, after serving their purpose, degenerated and disappeared. He would like to know with regard to odontoblasts when that took place, because they all knew that in abrasion and erosion secondary dentine is formed to a large extent, and he was always under the impression that so long as secondary dentine is formed, odontoblasts are present, and that as soon as the odontoblasts disappear, the result is that no true dentine is formed at all, but simply a granular calcified mass without any particular structure. The author spoke of the calcareous deposit in the pulp where there were no odontoblasts, but he wished to know whether tubules were present constituting true dentinal structure, or whether it was simply a deposit of lime salts in the pulp tissue. That was an important point of distinction.

Mr. Mansbridge, referring to the process employed, said that in his experience he found that the cells did have a great tendency to shrink after the acid treatment, therefore it would be important to know whether there was the same tendency to shrivel in the Weil method of preparing specimens.

Mr. Hopewell Smith, in reply to Mr. Bennett, said the particular sections he had shown were all prepared by his own process; and in reply to Mr. Mansbridge he might say that he believed that the appearances to be found in his own specimens would be similar to those obtainable by the Weil process. He was not a good hand at the latter, and had not made many observations upon specimens prepared by that process. He had asked Mr. Mummery for such a specimen, but unfortunately Mr. Mummery was ill, and he had not had the opportunity of comparing the two methods in their results, though he hoped to do so before long. It was very difficult to say where was the alteration of structure in cells after chemical agents had been applied to them. No doubt *post-mortem* changes occurred almost immediately after a tooth had been extracted, and it was very difficult really to find the true condition of things. He had made experiments with glycerine and weak acids, and had not found any marked alteration in the structure of the cell as far as he had gone at present. It was probable that in general histology the cells under the microscope were not actually the same in appearance as living cells, no matter how carefully the sections had been prepared. Of course the diagrams exhibited were diagrammatic, showing rather an exaggerated form. There might possibly be shrinkage, but he found that if they could get the delicate fibril absolutely *in situ* there could not be much shrinkage, because the fibrils were of more delicate a nature than the odontoblasts themselves, and even the capillaries of the pulp retained their normal shape. Referring to Mr. Maggs' remarks, he was afraid he did not know much about Dr. Sudduth's theory of odontoblasts "presiding" over the formation of dentine. He believed that odontoblasts disappeared in old teeth He had described them in a paper on "Fibroid Degeneration of the Pulp," in the *Journal of the British Dental Association* as odontoblasts, but thought he had been mistaken, because, although they occupied the periphery of the pulp, he could not really make up his mind, that they entered the tubules. He therefore now believed that in old teeth the odontoblasts disappeared. The calcareous deposit in the dentine nodules in the sections shown, apparently contained no tubules; they had a laminated structure, but there was no definite dentinal tubule. He should be glad to have his sections examined a little more carefully by members in order to ascertain if there was shrinkage or not. He did not think there was evidence of their shrinkage, inasmuch as the tubules had fibrils entering into them in what he understood at present as being a normal manner.

The chairman tendered the thanks of the Society to the reader of the paper, and to those who had brought forward Casual Communications.

STUDENTS' SOCIETY,

VICTORIA DENTAL HOSPITAL, MANCHESTER.

A General Meeting was held on November 28th, 1893. The President, J. W. Minshall, Esq., in the chair.

The minutes of the previous meetings were duly read and confirmed.

Mr. P. A. **Linnell** proposed that a special vote of thanks be given to those ladies and gentlemen who kindly came forward at the reception, and favoured the company with songs, etc. This was seconded by Mr. F. M. F. **Bellaby**, and carried unanimously.

Mr. A. J. **Lees** proposed, and Mr. A. **Leeming** seconded that the following gentlemen be admitted members of this Society, viz.:—

Messrs. E. F. B. Beyer, J. J. Breakell, C. B. Dalby, M.R. Leeming, B. North.

The ballot for these gentlemen will be held at the next meeting.

Casual Communications.

Mr. F. M. F. Bellaby exhibited an articulated skull of a mouse which he had received from Mr. Williams.

Mr. Minshall then read the Presidential address, which we publish on page 7. At its conclusion he called on Mr. F. Molloy for his paper on "Impressions and Impression taking," which we also publish on page 1.

Mr. W. Simms rose and complimented Mr. Minshall upon his very logical, methodical, and ideal address. He considered that it had the right ring about it, that of humour combined with intelligence. He proposed that a vote of thanks be tendered to Mr. Minshall, which was seconded by Mr. J. Theakston, and carried unanimously with acclamation.

Mr. Minshall in a few well chosen words, thanked the members for the attention with which they had received his address, and proceeded to open the discussion on the paper just read by Mr. Molloy. He said that he objected to the statement made by Mr. Molloy regarding the exclusive use of composition. The defects he had most noticed in composition were its absence of elasticity, and in contradistinction to this its want of brittleness. For either of these two properties was essential in a perfect impression material. He was himself an advocate of gutta-percha.

Mr. W. Simms said he had listened to the paper with great pleasure, the more so, because he had discovered that the essayist possessed a fund of dry humour which he hoped the Society would have the advantage of enjoying on many future occasions. He, however, considered that the paper might have been made more interesting by a demonstration of the working capabilities of the materials now in use. He personally was an advocate for special trays, using composition especially if the teeth had elongated. He did not quite follow Mr. Molloy's plan of syringing out the mouth with cold water while the impression was in the mouth, as he thought it made the patient swallow which was above all things to be avoided. He had found that where patients were in the habit of swallowing when the impression was being taken, the introduction of the saliva ejector was an efficient remedy. Full upper dentures in his opinion always indicated a special tray, using composition. He considered composition superior to plaster in these cases, because plaster gives way too much. and does not cause pressure on the soft tissues and muscles situated at the back of the mouth, which in most cases is highly desirable. With regard to gutta-percha, he had found it especially useful in cases presenting isolated teeth, or teeth hanging away from each other. In conclusion, he thought that we should become acquainted with the properties of all the various impression compounds, as we should no doubt find them all useful at some period of our career.

Mr. P. A. Linnell emphasized the fact stated by Mr. Molloy that impression taking was of the greatest importance in practice. Composition was in his mind of greatest ordinary use for all artificial work, while for regulation plates he preferred gutta percha. This latter is sold in sheets, and is readily softened. With regard to plaster he had no doubt but that very correct impressions could be obtained with it. However, this too correct impression might in some cases be a disad vantage, for a dentist in London had told him of a case made to a plaster impression which had taken one hour to insert and three hours to withdraw.

Mr. H. Dreschfeld preferred using composition for everyday work. He had used gutta percha in a few cases, but had found it to shrink in some of them. For lower cases plaster was in his opinion of the greatest practical use.

Mr. G. Booth advised the application of cocaine to the palate which would anæsthetize the soft part and prevent vomiting and retching.

Mr. J. A. Lees referred to the difficulties experienced in taking impressions in plaster of Paris where stringy saliva was present. He recommended that the mouth should be rinsed with soda water, and if any came away with the impression it should be washed with methylated spirit. He considered that there should be some effort made at that hospital to bridge over the gap existing between surgical and mechanical practice so as to include the taking of impressions bites, &c. He advised the present students to get as much practice as possible by taking impressions for regulation plates.

Mr. D. Headridge said that a great deal had been claimed for the elasticity of gutta-percha, but of all the samples he had tried he had not yet found an ideal one, i.e. one presenting a reliable elasticity. He thought that every tray should be tried in the mouth before using, or false results would sometimes be produced. In taking lower impressions, great care should be taken to draw the cheeks well away otherwise a bad impression will result.

The PRESIDENT then called upon Mr. Molloy to reply to the points discussed.

Mr. MOLLOY in his reply said that he had intended to give a demonstration along with the paper, but as he was put down in the syllabus for the first paper he had not had the necessary time. In conclusion he thanked the members for their friendly reception of his paper.

The meeting then terminated.

Dental News.

NATIONAL DENTAL HOSPITAL.

The Annual Dinner of the past and present students was held in the Venetian Saloon of the Holborn Restaurant, on the 8th ult. Professor Michael Foster, F.R.S., presided, and amongst the guests were Sir J. Crichton-Browne, F.R.S., Professors Victor Horsley, F.R.S., C. Sherrington, F.R.S., Dr. Sidney Coupland, Messrs. Mummery, Morton Smale, S. J. Hutchinson, Ashley Barrett, F. Canton, Stanley Boyd, G. H. Makins, W. G. Spencer, Bland Sutton, and Munro Scott.

After the loyal toast, the Dean (Mr. Spokes) read the following Report :—

" During the past twelve months there have been a few changes amongst the Staff. Unfortunately we have to lament the loss of one of our number by death, Mr. Percy White, M. B., having fallen a victim, in the prime of life, to typhoid fever. Mr. W. R. Humby has found it necessary to resign his appointment as Dental Surgeon, but we are glad to remember we still retain his services in connection with his valuable and popular demonstrations on dental mechanics. The vacancies thus created have been filled by Mr. Glassington's appointment as Dental Surgeon, and the election of Messrs. Sibley Read and Edgar Beverley as Assistant Dental Surgeons. Mr. Ogle has also succeeded Mr. S. E. Pedley as Anæsthetist.

"Perhaps the most important occurrence in the interests of the Hospital as a charitable institution, and of the School, has been the removal to the new building at the corner of Devonshire Street. As most of you are aware, the Dowager Lady Howard de Walden took a great interest in the treatment of the poor so long carried on under such disadvantageous circumstances. Her ladyship not only helped us to secure a capital site, but afterwards at her own expense, caused to be erected our present Hospital, which in its arrangements promises to be a model of what a Dental Hospital and School of its size should be. Although we are not yet out of the builder's hands, our removal to the new premises has been a great advantage to both patients and students. A more formal and functional dedication to the popular needs is expected to take place when the final details are completed, and I am happy to be able to announce that His Royal Highness the Duke of York, has not only consented to come and open the Hospital early in next year, but has graciously signified his willingness to become President of the Institution. Those who know the great interest the Right Honourable the Earl of Strafford has always taken in our work, will also be gratified to hear that his Lordship will act as Vice-President.

"From a School aspect, the successful training of students is of course the point most to be considered, and as evidence that the efforts of the staff of surgeons and lecturers have met with some success, I may mention that our last batch of four students were all successful in obtaining their diplomas at the Royal College of Surgeons of England. I am also glad to report that our new entries, both in numbers and capabilities, give every reason to believe that although our School may be small compared with others, the immediate prospect is full of promise."

The Chairman then distributed the prizes and certificates for the past session as follows :

Rymer Gold Medal ...	Mr. T. C. Reece.
Ash Prize	do.

Dental Anatomy.

Certificate	... ...	Mr. R. R. Ward.

Dental Materia Medica.

Medal	... ...	Mr. R. E. Nicholls.
Certificate	... ...	Mr. H. W. Tice.

Dental Mechanics.

Medals	... ...	Mr. T. G. Jenkin, Mr. Norman Reeve.
Certificate	... ...	Mr. T. C. Reece.

Metallurgy.

Medal	... ...	Mr. Norman Reeve.

Dental Surgery.

Medals	... ...	Mr. H. J. Relph. Mr. T. C. Reece.
Certificates	... ...	Mr. S. F. Rose, Mr. T. G. Jenkin.

Histology.

Certificates—Mr. H. J. Relph, and Mr. S. F. Rose.

Students' Society Prize—Mr. R. E. Nicholls.

Prof. Foster in proposing "Success to the National Dental Hospital and College" alluded to the change which had taken place in the practice of Dental Surgery—a change of a political type; for the old policy of treatment was "radical," whereas the present was distinctly "conservative." It seemed that now, upon a mere fragment, a tooth could be built up which might be a false tooth, but not a treacherous one, and that extraction was considered a disgrace. He referred to his salad days when perhaps the wrong tooth was taken out and nothing said about it. Then there was "the key," an instrument which appeared a cross between a boot-hook and a rat-trap; when recalling his experiences, sad memories came over him. Now the armament of tools was very different, and various branches of science, such as chemistry and bacteriology, were brought into requisition. The dentist whose art was built up of such like sciences could no longer take a free plunge. No doubt it led to an expensive education and might raise the question—"Is the game worth the candle?" but it must be remembered that with an increase of ability came the increase of fees. The laws affecting the "struggle for existence" held good for dentistry also; knowledge meant power; knowledge was potential energy, but wanted properly directing. After alluding to the work of the school, Professor Foster pointed out there was another aspect of the Hospital—that of Charity. In dealing with disease the first line of defence was to take care of the teeth and there was a great field for the dental profession. It was a matter of national importance and its claims were not sufficiently recognised. By holding with one hand to science, and with the other distributing to the public, dentists would do good work.

Mr. Percy Edgelow responded on behalf of the Hospital, aud Mr. Sidney Spokes for the School.

Mr. S. J. Hutchinson, in proposing "The Past and Present Students," pointed out that the professional examination was not the only one, and that to pass in the "public" examination to do honest and good work was the true road to success. Amongst other excellent advice he urged the present students not to overlook the recreative aspects, and spoke in favour of an amalgamation of dental athletic clubs.

Mr. P. W. Greetham in responding for past students referred to the history of the School, and of the debt many, now in successful practice, owed to it.

Mr. M. Farmer, for the present students, alluded to the old standing grievance that dental students were not treated at the General Hospitals on the same footing as medical students. He expressed the opinion that although they were "only dentals" they were worthy of more consideration.

Dr. Maughan proposed "The Visitors."

Sir James Crichton-Browne, in an able and witty reply, was under the impression that the subject as to the value of teeth in the expression of the emotions had not yet been properly worked out. So far as he was concerned his teeth were at that moment expressive of gratitude for the hospitality shown to the visitors. Speaking in favour of the Dental profession he regarded it as a natural and inevitable special branch of medical science.

Mr. F. Canton also responded in a genial speech.

Mr. George Cunningham, as a former student under Prof. Foster, was able to speak in an eulogistic manner of the various personal good qualities which characterised the Chairman, whose health was received with musical honours.

Professor Foster briefly replied.

Violin solos by Mr. John Pitts, and excellent songs and recitations by the Students and their friends, were rendered during the evening and continued to a late hour.

EXAMINATION QUESTIONS.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

The following were the questions set in the papers at the recent examination for Diploma in Dental Surgery :

2 to 4 o'clock, p.m.

N.B.—The Candidate is required to answer at least one of the two questions, both in Anatomy and Physiology, and on Surgery and Pathology, unless he is entitled by the Regulations to exemption from any of those subjects.

Anatomy and Physiology.

1. Describe the Inferior Maxillary bone.
2. Give the position and relation of the Tonsil; the vessels and nerves which supply it. State its functions.

Surgery and Pathology.

3. Give the pathology, symptoms, and treatment of Erysipelas following a slight wound of the cheek.
4. Enumerate the causes which produce Salivation. Give your treatment both preventive and curative.

5 to 8 o'clock, p.m.

N.B.—The Candidate is required to answer at least two of the three questions, both on Dental Anatomy and Physiology, and on Dental Surgery and Pathology.

Dental Anatomy and Physiology.

1. What is the homology among Mammalian Teeth? How do the teeth of the horse, tiger, and rabbit conform to the typical Mammalian Dentition?

2. How would you demonstrate:
    1. Naysmith's membrane,
    2. Interglobular spaces,
    6. An encapsuled lacuna?

3. What structural connection exists between the Cementum and the tissues contiguous to it, and what purposes are served by such arrangements?

Dental Surgery and Pathology.

1. Describe the operation of Extraction of Teeth. Give the reasons for the manner in which each tooth is removed, and state the various conditions necessitating extraction.

2. What is Secondary Dentine, and under what circumstances is it found? What is its structure, and when is it beneficial or otherwise?

3. Under what circumstances would you use a local Anæsthetic? What applications are employed for the purpose, how and when are they used, to what extent is each of service, and to what local change is the Anæsthetic action due?

ROYAL COLLEGE OF SURGEONS IN IRELAND.

The following were the questions set in the papers for the Primary Dental Examination, held in November, 1893. All the questions to be attempted.

4 to 5 o'clock, p.m.

Anatomy.

1. Write a brief description of the Premaxilla.

2. Describe the antrum of Highmore. To what cavities are its walls related. Into what space does it open?

3. Describe the soft palate.

4. Describe, or give diagram of, the outer surface of the inferior maxilla, and name the muscles attached. How is the bone affected by age?

5. Describe the alveolar process.

Histology and Physiology.

5 to 6 o'clock p.m.

1. Describe *either* enamel or dentine as to
   (*a*) Minute structure.
   (*b*) Chemical constitution.
   (*c*) Nerve supply.

2. Give the microscopic structure of a cerebro-spinal nerve fibre.

3. What are the constituents and uses of Saliva?

4. Describe the mucous membrane of the gums.

5. The same nerve supplies sensory fibres to the teeth in the lower jaw and motor branches to the mylohyoid muscle and anterior belly of digastric.

Explain the advantage resulting from this arrangement.

Chemistry.

11 a.m. to 12 noon.

1. Describe nitrous oxide, giving mode of preparation, formula and uses.

2. Describe the oxides of hydrogen, their chemical preparation, and give the formula for each.

3. Define the terms atom and molecule, and describe the process by which distilled water is procured.

4. Define amalgam, alloy, allotropism, electrolysis, catalysis, acid, base.

5. How may the formula of a compound be deduced from its percentage composition. For example, a body is found to consist of $\begin{array}{ll} \text{C} & 27\ 27 \\ \text{O} & 72{\cdot}73 \\ \hline & 100{\cdot}00 \end{array}$ grains. What may be its formula?

PASS LISTS.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

The following gentlemen having passed in the necessary examinations, have been admitted Licentiates in Dental Surgery.

P. Artiss, H. G. Ashby, W. Badgery, F. H. Bailey-King, W. H. G. Baker, A. L. Bostock. E. Bowden, A.V. Brimmer, F. C. Bromley, L. Brown, R. J. Bulgin, J. H. Burroughs, F. H. Carpenter, S. H. M. Carpenter, E. Clayton, E. V. Coles, A. B. Densham, M.R.C.S. Eng., W. A. Densham, D. Dunlop, A. J. G. Evans, J. R. Freeman, W. W. Gabell, C. F. Haines, J. T. Hankey, A. W. Henly, W. M. Jones, S. Keele, E. V. Knight, H. Love, W. J. May, W. F. Mellersh, L. B. Myers, J. B. Parfitt, H. J. Pickering, H. B. Rowe, R. Satterthwaite, A. N. Sumerling, F. Walker, F.H. Wallis, R. R. Ward, G. W. Watts, G. B. Webb, R. Wheatley, G. Whitworth, G. Williams, and W. R. Wood.

Seventeen candidates were referred back to their professional studies for six months.

Royal College of Surgeons in Ireland.

Licence in Dental Surgery—The following candidates have passed the primary part of the examination :

Frederick Edward Davies ; John Stanton ; Francis Owen Stoker.

The following Candidate has passed the final part of the examination, and has been granted the Diploma in Dental Surgery of the College.

Henry Edmund Rose, D.M.D. Univ. Harvard.

ROYAL COLLEGE OF SURGEONS IN IRELAND.

Dental Examinations.—The following candidates having passed the necessary examinations, have been admitted licentiates in dental surgery of the College :—Mr. A. H. Carter (Dublin) ; Mr. J. H. Milnes (Huddersfield), Mr. H. E Rose (Birmingham) ; Mr. W. H. Wright (Bakewell). The next examination will be held on Monday, February 12th, 1894.

DENTAL ASSOCIATION OF VICTORIA.

The ordinary monthly meeting of the Council was held on Thursday evening, the 21st September, 1893, at eight o'clock. In the unavoidable absence of the president (Dr. Springthorpe the chair was occupied by the vice-president (Mr. John Iliffe).

The question of having some prominent members of the profession placed on the Commission of the Peace was considered, and the desirability of such a course was unanimously affirmed. It was resolved to take action in the matter.

The Secretary reported that a large number of copies of the pamphlets issued by the Association on "Useful hints on the care of the teeth," had been sold, and orders for copies were still being received. The pamphlet had been spoken well of on every side.

A letter was received from Mr. Alfred Reeve, J.P., of the Dental Hospital of London, tendering his resignation as a member of the Council of the Association, as the pursuit of his dental studies in London would not allow of his return to Melbourne for a considerable time. Mr. Reeve's resignation as a member of the Council was accepted with regret, and on the motion of Mr. Baker, seconded by Mr. Stevens, it was resolved to forward a letter of thanks to Mr. Reeve for his services to the Association.

The filling of the vacancy caused by Mr. Reeve's resignation was deferred to the next meeting of the Council; the names however, of several gentlemen were mentioned

The meeting then adjourned.

APPOINTMENTS.

John H. Glassington, L.D.S. Eng. has been appointed Dental Surgeon to the Croydon Hospital, *vice* Morgan Hughes, M.R.C.S., L.D.S., Eng. resigned.

The election of Hon. Dentist to the Melbourne Hospital took place on the 10th October. There were three applications for the position, Messrs. Oldfield, Dillon and Eskell. Mr. Oldfield has been honorary dentist for the last twelve months. A ballot was taken, and it resulted in the election of Mr. Dillon, who secured 10 votes. Mr. Oldfield secured 8 votes.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

DENTAL APPOINTMENTS.

To the Editor of the "British Journal of Dental Science."

Dear Sir,—I should like to raise the question of Dental Appointments to Cottage Hospitals, &c. I would instance a case in point where a qualified dentist wrote the Committee stating that should they think it desirable to appoint an Hon. Dentist, he would be pleased, if they thought well to appoint him, to render any services of which he was capable. The matter was considered by the general Committee, and it was decided that it *was* desirable to appoint an Hon. Dental Surgeon to the Hospital, and the applicant was appointed to the post, subject to the approval of the medical staff. When it came before the medical committee they recommended the general committee to appoint applicant Honorary *Consulting* Dental Surgeon, giving as a reason for not appointing him Honorary Dental Surgeon that as such he would be entitled to beds, and they had few and could not give any up to an Honorary Dental Surgeon, Now, although I am probably the oldest-established professional man in the town, i.e., older than any of the general medical practitioners, and there should not be, and indeed I am not aware that there is, anything but good feeling between us, yet I cannot help taking a little time to consider the question whether I could accept such an appointment as Honorary *Consulting* Dental Surgeon, as it appears to me to be a somewhat left-handed compliment thus to shelve me in not appointing me on the medical staff, as I believe is usually the case. I should like also to know if it is usual for the general committees of similar institutions to delegate, or give over, their powers to the three or four medical men forming the staff to decide who shall, and who shall not, be appointed on the staff. Any way, such is the case in this instance, and it appears the medical men have obtained such terms from the general committee, and this is formulated in one of the rules.

Now let us look for some reasons why these gentlemen should take the line they have done. The committee consider it desirable that a Dental Surgeon should be appointed: the medical men not wishing to go against the recommendation of the committee, or not wishing to hurt my feelings, recommend my appointment as Honorary *Consulting* Dental Surgeon. Thus I should not be placed on the staff, and should not be an *ex officio* member of the committee. Or is it that they would feel themselves almost compelled to discontinue the practice of dentistry themselves? for I may here state that these gentlemen in the ordinary course of their practices, are not above the wholesale extraction of teeth hundreds of which need never have been extracted at all; and for these operations they consider themselves sufficiently rewarded by an honorarium or fee of one shilling per tooth. So much for professional dignity. I am writing this through you to obtain from my professional brethren an expression of opinion whether I could accept such an appointment, and still retain my self respect.

I am, yours truly,
L. D. S. I.

[We allude to this letter elsewhere, but some readers may feel inclined to answer our correspondent's question. As to the action of the Staff, it is a pity that L.D.S.I. has forgotten to assure us that he has always conducted his practice on professional lines, and given no cause of offence in this direction. Ed.]

Dental Hospital Reports.

Work done at the Victoria Dental Hospital of Manchester, during the month of November, 1893.

Number of Patients attended .	992
Number of Extractions . .	590
Number of Extractions under Anæsthetics ,	209
Gold Stoppings . . .	82
Other Stoppings . . .	244
Miscellaneous {advice, temporary fillings, scalings, dressings, &c. . .	434
Crowns	18
Inlays . , . .	4
Total . . .	2753

Henry T. Dreschfeld, *House Dental Surgeon.*

The following is a Report of the work done in the Dental Department and School of the General Hospital, Launceston, during the months of August and September:—

Extraction of teeth and roots . . .	95
Stoppings (various) . . .	22
Regulation of Children's Teeth . .	8
Operations under Chloroform . . .	3
,, Nitrous Oxide Gas . .	3
Miscellaneous Operations . . .	37
Advice Cases and Prescribing . . .	27
Mechanical appliances supplied . .	2
Total .	197

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DEVELOPMENT, GROWTH, AND CONDITION OF THE TEETH AS A TEST OF HEALTH.

By Edward Lund, F.R.C.S.
Consulting Surgeon to the Manchester Royal Infirmary;
Emeritus Professor of Surgery in the Owens College,
Victoria University; &c. &c.

Mr. President and Gentlemen,—It is with some diffidence I venture to bring before you this evening the few remarks I have to offer on the development, growth and condition of the teeth as a test of health, when I think how imperfectly I can attempt to lay before you my views on these subjects, knowing that those whom I address have ten times the opportunities I ever had to verify or to disclaim the propositions I am about to submit to your consideration.

The more we regard each department of our profession as worthy in its turn for patient investigation, and when we remember how impossible it is for any one mind, in a lifetime, to compass the whole in all its aspects, we ought to acknowledge with admiration the results of the labour and care bestowed on the details of dental surgical practice by which the English School of Dentistry has gained for itself that social and professional status to which it is justly entitled.

Perhaps on such an occasion as this, he who presumes to come here to teach may himself remain an earnest listener and have much to learn, for, in every branch of our profession it is not so much the knowledge of which we have a right to boast, as the means we have at command to extend our knowledge and to discover how much of certainty we have yet to seek for. We must admit our ignorance of many things which we do not comprehend, and then proceed to cultivate with all diligence, that curiosity and appetite for knowledge which should ever be the best incentive to our progress in the future.

It therefore seems to me, gentlemen, if you will allow me to place before you to-night a number of interrogations, so to say, respecting many things of which doubtless you know a great deal, and of which I want to know a great deal more, I shall be a gainer by this arrangement, because if you can answer the questions I would put before you —well and good, or, if you fail to supply a ready answer to my enquiries it may be that I may provoke in your minds a more extended line of thought in special directions of observation, in which at last the true interpretation of our searching may become apparent.

In dealing with the teeth and all their subsidiary organs as factors of health, it would be well, I think, to speak of the teeth in general terms at the three epochs of life—in infancy and early life, in middle life, in the decline of life and in old age.

It has been given as a definition of health: "health is wholeness;" for in any animal, whether human or comparative, the functions and duties of its various organs are so correctly performed that there are no gaps or flaws in the rhythmic order of every performance, and although the wondrous power they possess in so many ways of supplementary action, where one structure or one organ acts as a substitute for another, yet this would not be health; it would in truth be the beginning of disordered health. Each should effec that which is its assigned duty and no other, that the ceaseless harmony of the many functions may never be interrupted.

This brings me to refer to the time-rates of functional changes, say in the development of the teeth. Not only do the teeth grow in a definite order, but the time-rates at which they grow is their normal law. At a certain fixed period in the life of an infant the germs of the teeth steadily advance in a pre-arranged order. Of course, dentists in their practice have less to do with the primary eruption of teeth than medical men. It might be well, I think, if the dental surgeon were occasionally to be consulted as to the possible cause of delay in the eruption of the teeth, and so to hasten their appearance through the gums, and with it to bring on more rapidly the accompanying changes in the child's digestion. There is one curious point which I have often noticed in very young children, and it is this—a child may be under twelve months of age, it has 8 incisor teeth, well protruded through the gums, and a fulness in the lateral gums indicating the approach of more teeth, and yet on examination of the skull itself you may find the cranial bones are not approximated, a wide fontanelle is present and no attempt at closure, without any proportionate deformity of the skull or any hydrocephalic changes. Here there has been, as it were, an interruption in the order of events ; a disturbance in the time-rate of changes. Nature has occupied herself, if I may so say, in the rapid advance of the teeth, and the delay in the closure of the inter-cranial spaces is apparent. I have often seen in similar cases, the great rapidity of tooth-advance has not been followed by good digestive power, the time-rates have been deranged and ill-health has resulted.

I will not commit myself to any law of the exact order in these events, but I would say it is in accordance with many other functions prematurely established that they are apt to decline at an equally rapid rate. It seems to me, whenever there is irregularity in the time-rate of development, the changes which occur the most rapidly are generally those which appear to be the first to fade and pass away. It is a common remark of parents, when we ask as to the rate and order of time in which a young child has had its primary teeth, we are told the teeth came through the gums very early and without difficulty, but in a year or two, it may be as soon as the teeth were cut, each tooth in succession exhibited signs of early decay. So much for an illustration of the harmony of functions or otherwise, as far as time, etc., of growth is concerned.

Now where in a skeleton one section or division has exhibited an irregularity of growth, other parts of the same skeleton will often suffer. In early life and in middle life we may, I think, with advantage look to the shape of the lower jaw as an index of developmental power and the measure of its intensity. The peculiar shape of this bone may be roughly compared to an arch placed horizontally in the skull. In one form of it, it may be said to resemble a narrow Gothic arch,or to be a wide Norman arch by contrast. Now I would take the lower jaw as being one of the three hæmal arches found in the skeleton, and they appear very frequently, not invariably, to be closely associated in their rate of growth. If we see a narrow pointed lower jaw with small projecting chin, the hæmal arch of the thorax will be very often narrow also, and certainly, in comparing skeletons, the hæmal arch of the pelvis will be found to be narrow likewise, making every allowance for the difference of sex in each particular instance. These three arches will generally be found to have been developed on a parallel scale. A large broad chin, a Norman arch, with a wide chest and projecting wide hips will often be found to be co-associated.

Sir James Simpson once made the remark, which attracted my attention; " you will generally find in a woman with a dimpled chin, that she has a wide lower jaw, and with it a deep wide pelvis." And here, in this very comparison we have an illustrative example that, in subjects with large well developed hæmal arches, the nutritive processes are for the most part, though not constantly, carried on with greater vital energy, with more staying power, both physically and mentally, than in those in which neurotic changes are conspicuous; and these are the persons who suffer from intense neuralgias and high tension of the nervous system with all its attendant consequences.

Apart from hereditary tendency, and having regard only to individual examples, the state of the teeth as they emerge through the gums is an excellent test of vitality and energy in the direction of nutritive changes. The size of the primary teeth, the order of their appearance, the condition of the enamel, the peculiar shape of the point or crown of each tooth is either a hopeful or a doubtful proof of the part the teeth are destined to take as aids to digestion and nutrition of the whole body. When in my early days of student life, a resident for many years in Guy's Hospital, I attended from sheer curiosity a few of the lectures in Dentistry given by that excellent dentist, Mr. Thomas Bell, (as well a naturalist as a zoologist of great reputation), I remember quite well, as a proof of the teaching of pathology in those days, it was a recognized cause of dental caries that inflammation going on to molecular death of the dentine took place beneath the covering of the enamel, and so impaired the firm structure of the latter that it broke down under pressure and a cavity was produced in the crown or point of the tooth. And with this idea prevailing it was natural to assume that teeth might be said to be carious before they erupted through the gums. Whereas I presume it is now an acknowledged principle in dental pathology that so long as the enamel coating of a tooth is intact and entire,—no crack or fissure pre-existing in any part of it—the dentine beneath will escape any morbid change. Mr. Bell declared a softening of the enamel began in its deeper layers, it was a centrifugal not a centripetal alteration of structure ; modern dentists will say it always commences on the surface and then the protecting armour of the enamel being destroyed it no longer preserves the dentine, and inflammation and molecular death will follow to a limited or wide extent, and so it must be admitted by those who have studied most carefully the advances of modern pathology, that it is in the state of the enamel that we must seek for the starting point of dental caries.

If the latter view be the correct one, the only practical conclusion on which to act, is to watch with the greatest care the surface of each separate tooth, and to fill, or to excavate and then fill, every little crevice or fissure through which the fluids of the mouth—the saliva with all its constituents, and the chemical changes which occur in it, come into contact with the dentine, and congest and inflame this tissue and lead to its death as caries. Whatever may be the precise order in which these morbid changes manifest themselves, and I presume the latter form of change is the more common one,—this condition of the enamel is at once a test and an index of imperfect health and impaired functions.

This may evince itself in the child in two ways, by frequent pain and distress from exposure to draughts of cold air acting upon the sensitive surface of the exposed and congested dentine ; or by pain produced by pressure on the same surface by minute particles of food driven into the cracks of the enamel, and there held, and causing irritation until the pressure, has in some way been removed. One or both these effects may follow, slight in degree in their earliest stages, but creeping on insiduously as these changes are multiplied. The giving way of the enamel at any point will lead to extension of decay to the body of the tooth, and the same diseased condition may repeat itself to some degree in the gum which is near to the tooth, travelling along the mucous membrane of the mouth to the side of the tongue, to its dorsal surface, and to the mouth glands on the cheeks and lips. Gastric irritation, with loss of appetite, and dyspepsia must soon follow these changes ; but with these there will be, in a very young child, in whom the teeth are inflamed and tender, mastication and insalivation of the food insufficiently performed, and either anorexia, or sickness, or headache, or diarrhæa, will help to bring about deranged health, and the child will certainly be fretful and irritable, and in the end imperfectly nourished. All this may be due to the want of perfect mastication, and thorough insalivation of the starchy food so largely supplied in the diet of a child, and so spoil its health ; or the child may have been feebly developed, and this may set up a very similar morbid condition, by interruption of the normal functions connected with growth, from constitutional, rather than local causes.

I know not how to advise more frequent careful inspection of the progressive advance of the primary teeth than is usually adopted, for, I am well aware your little patients are apt to resent any interference—for their own good—with their masticating machinery. Yet it is quite evident, wherever we detect early caries in the primary teeth, it is itself an indication of feeble health, and this will be reduplicated a thousand times where the imperfect teeth are allowed to remain as a continued source of daily, hourly trouble.

It is one of the popular objections made to medical men that, if to relieve pain and cerebral congestion, and even to avert epileptiform complications, the sac of a primary tooth has been incised, and pressure and prolonged irritation have so been removed, the child, in after years, will have imperfectly developed teeth which will quickly decay.

This is then said to be due to the crown or the apex of a tooth having been injured when the gums were lanced! But it is far more probable, although difficult to prove, that the interrupted health which existed some weeks before the gums were lanced, and when the consolidation of the enamel on the teeth was imperfectly completed, is the condition which will show itself as the tooth rises above the gum. Thus the surgeon is often blamed for such a supposed injury to the tooth, which was in no sense an injury, but a proof of original defective growth. In the set of permanent teeth we have often marked proofs presented to us of the effects produced in the development and growth of the enamel of those teeth, in which during the six years of a child's life, nutrition and growth have been imperfect. Those failures of health have left indisputable traces of lines of arrested growth in the enamel, or spots of opaque enamel devoid of that porcelain character of sound enamel, with all that hardness in miniature imitation of the colossal basaltic columns of the Giant's Causeway. It is difficult, I know, to decide among patients in early life, how much of their feeble health should be referred to congenital proneness to disease, or how much of it is due to unfavourable circumstances and unhealthful environments.

If it ever should be accepted as a rule of practice in dentistry, that the culture of the teeth in children should have systematic attention, and still more so if the public and those who have charge of the young would consent to periodical inspection of the condition of the teeth long before toothache has set in, and before decay has seriously advanced, it might be possible so to avert or arrest the advance of dental caries, with changes in the gums, either as diffuse superficial inflammation or passing into local abscess. All this might be prevented and a very great gain would result. Whereas, it must be, I feel sure, a matter of great difficulty to determine, whether, with carious teeth in children in which the pulp cavity has been exposed and rendered exquisitely tender, and the walls of the tooth so fragile that it cannot be filled, there is any alternative proceeding to removing the tooth by the operation of extraction. And here it is I would ask the question, does experience show that after the extraction of carious teeth—the primary teeth—does the arch of the jaw, in connection with either the upper or lower set, grow imperfectly? or is its future growth retarded? Does the removal of these teeth, it may be only the roots or fangs of such teeth which have to be dealt with,) cause a collapse, so to say, of the alveolar spaces into which the secondary permanent teeth are to enter? Should this really be so, and if it is desirable not to remove carious primary teeth, or if such removal can be avoided for the reasons just stated, then I think we have here an additional object for dealing with this question, and as a great argument to be brought forward in favour of early systematic periodical inspection of the growth and condition of the primary teeth. When these early extractions of teeth have been performed, particularly if a great number of such teeth have been extracted, as soon as the permanent teeth advance in growth and proceed to occupy some part at least of the vacancies so left, there must be a contraction of the alveolar arches and the crowding of the teeth, and the way in which they overlap and become disarranged, must be, I should suppose, a very frequent cause of misplaced teeth, with all the effects of lateral pressure upon the contact surfaces of the teeth, to say nothing of the damage received on the free surfaces of the teeth which are exposed to concussion and pressure by teeth improperly opposed to them in the act of mastication. I would therefore go back to my original proposition that a smallness of the hæmal arch of the lower jaw, and an insufficient expansion of the upper jaw must be a main controlling cause of crowded teeth.

All that can be said of the defects in the enamel will apply equally to the permanent as to the primary teeth, for I am not prepared to say that the enamel structure is in larger proportion to the actual size and bulk of the tooth, in one class of teeth than in the other.

I will admit it is an arbitrary division which I would now propose, to limit the period of middle life when we are speaking of the teeth, but I think we might grant that from the 25th to the 55th year of life teeth fully developed and well grown may remain unchanged, or nearly so, during the whole of this long period of 30 years, in a person otherwise of healthy constitution. From this date will begin a period of decadence, and the state of the teeth alone will show that old age is steadily advancing.

Now as to the changes in the teeth, of which there are so great a variety, it is only possible to select a few as illustrations of the causes and degrees of ill-health which such changes indicate. One source of change, which might be said to be almost an accident more than a disease, is where the integrity of the surface of the enamel has been destroyed by the production of minute cracks or fissures in it from external causes. Heat and cold, from sudden abrupt alterations of temperature, may be a possible cause of this without any immediate appreciable evidence of the receipt of such injury. I believe American dentists have said it is the indulgence at meals of very hot soups followed by iced drinks, taken in quick succession, which often gives rise to injury of the enamel, and which may be easily overlooked at the moment. There might be also injury to the enamel in another way. A chip or fracture in the enamel surface of a tooth from such a cause as would break the thin edge of an incisor tooth, caused, for example, by biting a fruit-stone or a very hard crust or biscuit; but with this difference, that here a fragment of enamel would be broken off and detached, deformity result, but yet the dentine would remain protected, and no permanent injury would ensue. If, however, it is a crack or fissure in the enamel with which we have to deal, this accident will be likely to include the whole thickness of the enamel, and from the very minuteness of the space so formed, capillary action will commence, the liquid, whatever that may be, will be drawn up into the crack which will soon be filled in its entire depth. As to what that liquid may be we cannot tell. It may vary at different times. Saliva is admitted by physiologists to be most frequently alkaline, but its chemical re-action may change from time to time, and it may become distinctly acid, and would be more irritating in this latter condition than in its former state. And in dyspepsia, in which the digestive processes are irregularly performed, the food taken in for solution by the gastric juice may not be digested in the normal way, and in this respect the stomach may fail, as well as the saliva in the mouth which ought to act upon the starch in the food, and by the diastatic ferment of the saliva should form dextrin and maltose, and these again may run on rapidly through the stages of saccharine fermentation with evolution of carbonic acid, or even the production of acetic or butyric acid as an ultimate result. Any of these irritating products having access to the exposed surface of the sensitive dentine may set up prolonged irritation and inflammatory changes in the tissue in question. Thus starting from a mere line of contact, its influence may spread widely, and although microscopic in its extent to begin with, may yet be large enough to set up a series of morbid changes, repeated over and over again, by each fresh application of the excitant.

Again, as each fresh charge of acid matter is drawn into the capillary spaces or cracks in the enamel, we cannot be quite sure of the precise morbid changes which may there be slowly established, for even if it should only be carboni acid in solution, which should be constantly bathing the sensitive surface of the dentine with all the delicate tubular spaces it contains, this acid alone, in course of time, would set up congestion and inflammation, and finally death of tissue. For of this we are quite certain, that the chemical composition of the enamel is such, that having for one of its constituents calcium fluoride, it must possess naturally a great resisting power on the corrosive action of carbonic acid, since calcium fluoride is not soluble in it. If the enamel did not contain the fluoride as a protector, the ceaseless presence of the carbonic acid in expired air, would act very destructively on the dentine itself, as well as on the portion of bone tissue below the neck of the tooth, if by chance it had been so exposed and in contact with it.

We have another example to bring forward in which experience has shown that from defects in the enamel, contact of irritant matter with the dentine will set up injurious action, although, fortunately, it is now only a matter of past history. In the manufacture of lucifer matches, when green non-amorphous phosphorus was employed,the white fumes of phosphoric acid were dissolved in the fluids of the mouth, entering the cracks in the enamel, and it was a matter of common observation that this set up intensely serious effects which were soon observable. But it was often noticed that those in whom the teeth had good enamel were comparatively free from the phosphorus action, while those with damaged teeth exhibited all the consequences of contact with the dentine unprotected by the sheathing action of a complete enamelled encasement.

No doubt on many occasions in spite of all the care with which a dentist may proceed to inspect a set of teeth, so as to be able to pronounce with certainty that the surfaces of the teeth are perfect in their enamel, there may be defects here and there so slight, and advancing so gradually that they are often passed unnoticed, and it is to these diseased conditions to which I am now anxious to direct your attention, and I would do so under one or all of these three forms.

First, I would like to ask your opinion whether it may be regarded as an observed fact that very generally dental caries attacks more frequently the teeth of the upper than the lower jaw. If such be the case, and although I have often thought such were so, your greater opportunities for observation will no doubt soon decide this point, may it be due to this anatomical state of things? that the arterial supply to the lower set of teeth is more direct and more abundant, each separate tooth receiving its nutrient vessel from a sub-branch of the single large artery destined to supply each half of the lower jaw? whereas, in the upper set of teeth they obtain their nutrient vessels from branches or twigs of sub-branches, and less directly from the original parent artery.

Secondly, is there any correctness in the assertion, which I would like to venture to make now for your consideration and opinion—that we often see decided symmetry in the progress of dental caries, as it shows itself in the corresponding teeth of each side of the jaw irrespective of their being among the upper or the lower set?

Can this symmetrical dental caries be regarded as an evidence of the pre-existence of some constitutional defect or failure in the nutritive processes in the body, and possibly to general loss of trophic nerve-supply? Every allowance and consideration should be made, in giving expression to such opinion in any given case, to see whether the enamel has been so crushed by pressure and the dentine injured, by reason of the advance of the last of the permanent teeth—the wisdom teeth—or by the pushing forwards of the twelve years old and six years old teeth, or by these again acting by their advance on the pre-molars and the incisors, while the firmly bedded canines may have escaped displacement or injury by their solid resistance?

As soon as it can be admitted that progressive symmetrical caries is an expression of general dyscrasia, the circumstances under which this ill-health has commenced, or by which the same condition is prolonged, is just a valuable point in practice, in which the dental surgeon may be able to suggest and guide the medical attendant in his path of preventive treatment.

Thirdly, Is it not, may I ask, a question of very wide import to enquire, what is the possible cause, or causes combined, by which we see so constantly that the denizens in our large cities and towns are much more generally the subjects of progressive dental caries,—whether we look at them in the children or the adults—than we find to be the case in those who have been born, bred, and brought up in the free and open country?

One cause is very evidently present. In large towns and in large close-packed communities, the air inhaled is much less invigorating. The re-breathing of air in close and badly ventilated workshops, warehouses and dormitories, must throw extra work on the channels of escape from the whole set of mucous membranes in the body, which are compelled to act as eliminants of peccant matter which ought to have been dissipated through the skin. The result of this diverted action is to be seen in the bodies of those who live and work under these unfavourable conditions. For here we often find a continued, almost chronic congestion of the mucous membrane lining the mouth,the fauces, the nostrils, and the upper air passages, and, under a state of things here described, it cannot be a matter of surprise that, in all which concerns the development and growth of the teeth, great injury must result, when we know we must regard the teeth as modified outgrowths of the papillæ of the oral membrane, altered so as to fulfil their special function,—the dentine being the homologue of the papillary layer, and the enamel the homologue of the epithelial layer which covers and protects it. A permanently congested state of the mucous membrane of the mouth and gums must influence the growth and nutrition of the teeth at all stages of their existence, and this must be due primarily to unhealthy atmospheric surroundings, and its persistence, so long as this unhealthy state remains. The condition of the skin in any person, and the state of the hair, the nails and the teeth viewed in co-relation with all these will enable us to form a pretty correct estimate of the amount of vital energy with which we have to deal. How far the loss of the hair, imperfect growth of the nails, and active disease of the teeth together with morbid changes in the inflexion of the mucous membrane lining the alveolar recesses, may all be traceable to general nerve-exhaustion, brought on by a variety of causes, should always be held as a proof and warning of the effects of overwork, perhaps more mental than physical, and which might be summed up in saying, such an one is becoming prematurely old. When studying these effects upon the health, where they manifest themselves in the loss of teeth, or loss of the efficient action of the teeth, we have further troubles to deal with, of which these changes are only the commencement, and they are very often seen, in impaired digestion and assimilation of the food, or apart from this, painful digestion in all its forms, traceable almost invariably to imperfect mastication and insalivation of the food.

Fortunately, at the present day, by judicious application of mechanical aids in the early use of artificial teeth, made skilfully and with success, nearly all these permanent ill effects may be diminished or entirely overcome.

Whatever I may have already said to urge upon you the practice of systematic periodical inspection of the teeth of children, should indeed be advocated with equal force in the case of adults. Happy the man who has that confidence in the dentist whom he consults, as shall lead him to listen without dissent to any suggestions he may make for filling up the vacancies in his dental series, and as it were to try to make each tooth take its proper share in the process of mastication, in place of allowing the cutting teeth, or the tearing teeth to do the work of the grinders. I know, by what I have seen in patients whom I have had reason to think were not properly masticating their food, they were like the rodents nibbling in place of grinding, or in other cases not thoroughly comminuting the food they had taken by the direct action of their masseters,on account of tender surfaces or vacant spaces which had made this processa great difficulty, and then they unconsciously acquire the habit of rolling the food about in the mouth from one side to the other by the alternate action of their pterygoids, until the movements of a ruminant are about all they can perform.

When vacant spaces have occurred in the rows of molar teeth, and the line of either set has been interrupted, I have often asked myself whether if this had been corrected so as to preserve a perfect grinding surface to each jaw, would this alone, help to diminish the change in the angle of the lower jaw, between its rami and its body,which is observable when the molar teeth have been lost—and so prevent the incisor teeth failing to act in consort with that true scissor-like movement which they ought to have in biting and dividing the portions of food at the commencement of mastication? I know, as each permanent tooth has been lost by decay, or removed by extraction, the alveolar cavities which the teeth had filled, will be obliterated by absorption of the walls. This process being repeated *usque ad finem*, there will be very little remaining of the body of the lower jaw, if this is measured in its vertical plane; but the point to be considered is, will anything be gained of permanent benefit by the early use of artificial teeth, of suitable depth, to keep the jaws at the normal distance from each other, and preserve the angle of middle life, which then existed between the rami and the body of the lower jaw? This is one of the debatable questions I would now ask of your experience? and I would proceed to found on it an argument, that artificial teeth should be used at a much earlier period of life, for masticatory purposes, than is generally done, and which, alas! is so frequently accepted only as the last resource, in the way of artificial dentures.

There is yet one more idea which I would now submit to your consideration, and that is, the advantages secured to the vitality of the teeth, specially to the molars, a great number of which we may assume are still sound and healthy, the others having been lost or removed. Under these circumstances the opposing teeth, not meeting their antagonists, are no longer subject to that succession of concussions to which they are usually exposed in the act of pulverising and masticating the food which is to be brought between them, or, in the contact of tooth with tooth, without any food between them. These repeated vibrations, I doubt not, must exert some stimulating influence in the circulation in these parts. If we consider the effect so produced in each tooth, considered separately, and if we could draw an analogy between the physiological functions of the nails, the hair and the teeth, in the human body,—the one of these organs, the hoof, for example, in an animal, say in the horse, and the hoof is truly but the homologue of the nail of one of the digits in the foot, developed and modified to serve a special purpose—then, I think, I might be able to illustrate what I mean, if you will listen to an anecdote which I shall present to you, perhaps you will say from an unexpected source.

I have read in a treatise on the horse, how many of its characteristics have been impressed upon it by long domestication and personal attention, and that the ancient Greeks, in the glory of their horsemanship, instructed their grooms in grooming their horses, to steady the animal by its head while its feet were placed on the hardest rock or stone which they could find. As the animal jumped and plunged about, its feet, uncovered by metal shoes, as in modern times violently striking against the resisting hardness of the stone, would be subject to those powerful concussions which tend to develop and strengthen the firmness of the feet to a degree which must have fitted the animal to cross the roughest tracks of country in the longest journeys with uninjured feet. This it has been said, was the way in which the Greeks thought they could best improve their horses' feet, by exciting in the part which had been repeatedly exposed, to the most frequent blows.

Physiologists have not overlooked the possible effects of the vibrations which occur within the frame work of the human body or in the bodies of the lower animals during acts of locomotion. Mr. Hilton, an anatomist of great research, was one of the first to work out the theory that in the human cranium, for instance, there are within the vault and the base of the skull, thin and thick parts of bone, internal ridges or projecting rafter-lines,with thinner bone in the interspaces so limited. Then it is supposed that in each step in walking or during the rapid movements of the body, the vibrations travel upwards from the feet as they touch the ground, along the spine and arriving at the skull decussate and radiate along the lines of thicker bone, until at last the vibrations exhaust themselves, or are absorbed by meeting waves of molecular action coming in slightly different directions. Now we know anatomically, that the venous sinuses within the skull are all mapped out in grooves fashioned in those thicker lines of bone, and here the vibrations must advance with the greater intensity, or, to some degree, be increased in velocity by each succeeding current of vibration. Nutrition will be assisted by the accumulation of these repeated impulses, and in the same way blood will be hastened on in its transit by the powerful strikings of the feet upon the hard road in walking, each vibration contracting some arterioles to an infinitesimal degree for an instant of time, and each of these minute vessels having dilated to even a greater extent than before their contraction, and so the rippling of the blood stream in a thousand channels is helped along, and nourishment and life are ceaselessly renewed.

Now apply this same idea in watching the changes, which must be the same in principle upon the teeth and jaws in the movements of mastication. Let us suppose that we have to do with a case in which there are no defects or deficiencies in the components of the dental series, which meet in friendly combat and strike against each other. At each instant of sudden contact and concussion, the vascular state of every tooth must be rendered less turgid. It is like what takes place in the treatment by massage, where the blood is driven out of the small arteries by the act of compression and friction of a limb, and remains so for a moment, and then the blood will rush back into the same arteries with augmented force and energy;—this result, repeated a hundred times,—small as it may be when reckoned in units, will be appreciably valuable if long continued.

If it were not for tender teeth and congested gums, how much more vigorously would men bite their food and break it down, and soften it,and mingle with it that useful fluid—the healthy saliva. If all this could be done, would it not save the stomach very much work?—for food well masticated is more than half digested. Apart from the hurry of life—from the hasty meal, which is taken often as if by stealth by half the world, how can we expect the stomach to do all the work of digestion and assimilation combined? It is like having bricks made to order without stubble and without clay, or to have it unkneaded before it is to be used.

It is said of an eminent statesman of great renown, who has been a marvel of physical and intellectual power, for all but a century—whose power has been so powerful none can resist him, either personally or politically, that his daily practice of steady persevering mastication of his food is one, if not the one, great cause of his prolonged vitality and health. In my own experience I was acquainted for many years with a gentleman, now deceased, who was in his lifetime well known as a public character, and deeply respected in this neighbourhood—who attained great age, and whose children still survive him, and are in excellent health, and they in their early life were educated by their father with this grand motto—remember, 80 bites ! 80 bites ! each time before you leave the morsel of meat in your mouth to be swallowed and turned to good account.

Such careful training would indeed be excellent if it could be practically taught ; but the principle involved in it cannot be denied ; and if there be any in our joint profession who could help to lesson the ills created by the demon of dyspepsia, I know none who can do it more beneficially and effectively than members of the dental branch of our profession, if the public and individuals were early taught to seek their help, and have confidence in the lines of treatment which it may be their duty to recommend.

Thus I have laid before you, Mr. President and Gentlemen, the remarks I have had to make on the subject which forms the title of my address, and whilst I would thank you very much for the patient hearing you have given me, I feel I must apologize for the somewhat superficial way in which I have dealt with the subject, so that I would ask you to allow me to place before the meeting a summary of my remarks, as well as enquiries on doubtful topics, and with this I would conclude by leaving in your hands this list of the things most worthy of discussion and debate.

QUÆRENDA ET MEMORANDA.

I. How far has any relation been observed between the presence of a narrow pointed lower jaw, and the manifestation in the same person of signs of the neurotic temperament? and is there any comparison in this respect with those in whom there exists a broad lower jaw with an arch of the Norman type?

II. How far has it been observed that the primary teeth slowly erupted in agreement with the time-rates of such growths, are noticed to be more durable as primary teeth than others protruded more rapidly and at an earlier average age?

III. Are there any facts on record of examples in the primary teeth showing existence of imperfect enamel and commencing caries, before the actual eruption of those teeth?

IV. Is it possible to detect imperfect enamel and caries in the primary teeth in the very earliest stages, and is there any line of practice to be adopted which shall be essentially preventible in its results?

V. This failing, does the early extraction of carious primary teeth lead to defective growth of the alveolar arches, and the subsequent crowding of the permanent teeth?

VI. Is it a matter of frequent observation that there is a greater proneness to caries in the upper than in the lower set of teeth?

VII. Have cases of symmetrical dental caries been observed with sufficient frequency (not caused by crowding and pressure in the permanent teeth) to justify the conclusion that such symmetry of disease is due to some constitutional cause, inherited or acquired?

VIII. Will the persistence of a congested state of the mucous membrane of the mouth and gums be a cause, or an effect of dental caries ?

IX. Lastly, if it were possible, from time to time, to replace by artificial substitutes all the lost molar teeth, so immediately and so effectively as to preserve the level of the masticating surfaces, and give more powerful muscular action, would this be a means of postponing the change in the angle of the jaw, which has often been spoken of as essentially a senile change, and as not preventible ?

STERESOL, A NEW ANTISEPTIC VARNISH, is said by Dr. Berlioz (*La France Med.*) to adhere perfectly to the mucous membranes and the skin, the phenol (which is its active ingredient) not evaporating completely from the layer of varnish until after 24 hours. Its application is not painful, nor does it cause eschars, it is reported ; and is said to have been remarkably beneficial in ulcerations. It permits of permanent asepsis of mucous membranes and of parts of the body where it is impossible or difficult to keep on bandages. Its composition is as follows :

Gum-lac, purified, entirely soluble in alcohol	9 ounces.
Benzoin	2½ drams
Tolu Balsam	2½ ,,
Carbolic acid, crystallized ...	3⅜ ounces
Cinnamon oil	1½ fl. drs.
Saccharin	1½ drams.
Alcohol, sufficient to make 1 litre ...	33.8 fl.oz.

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SOME DENTAL QUESTIONS.

The paper read to the Manchester Odontological Society by Mr. Lund, and which we now publish, should prove a very welcome and valuable addition to our literature. To say nothing of the good which may practically result, it is very interesting to notice the aspects from which the author, a surgeon of wide experience, regards several well recognised conditions constantly coming under the notice of dental surgeons. That in a large proportion of cases the condition of the teeth may be utilized as a test in estimating the general state of health, most competent observers will agree; and to divide the individual's lifetime into three epochs, forms a convenient method in which to consider the question. At the close of his able and suggestive communication, Mr. Lund left to his audience a string of nine questions eminently calculated to raise a discussion in a Dental Society. The only criticism we would venture to pass upon the paper itself, is with reference to the allusions to congestion and inflammation of dentine, and, concurrently, to the omission to recognise the microbic influences in the production of caries. In regard to the summary of questions, there are two which seem of especial interest in connection with treatment. One concerns the period of childhood, the other the adult epoch, or the border-land between this and senility. Neither question is now asked for the first time, but, as in the case of many similar queries, a perfect agreement as to the answers is not yet forthcoming. We believe that the balance of opinion inclines in favour of a negative reply as to whether contraction or defective growth of the alveolar arches follow the too early loss of the temporary teeth. But this statement must be carefully made to refer to the osseous tissue of the jaws, and not to any subsequent crowding, or malposition, of the permanent teeth. There is reason to believe that in some instances in which temporary teeth are removed before their successors are sufficiently developed to maintain the space, contiguous teeth tend to approach each other, and crowd out the rightful occupant. For example, it may be noticed that when the second temporary molar has been prematurely removed, the neighbouring first permanent molar has a tendency to be inclined forwards so far as the articulation of cusps of its opposing tooth will allow ; and if both upper and lower second temporary molars have been so lost, the corresponding bicuspids may have their eruption considerably interfered with by the upper and lower first permanent molars "travelling" forward together.

With regard to the last of Mr. Lund's questions, he had noticed that some of his patients were reduced to a condition which reminded him of the Rodent's dentition, and he could not help thinking that a much earlier resort should be made to artificial teeth than is frequently the case. By furnishing proper functional surfaces at the back of the mouth, the incisors may be saved the wear and tear which they were never intended to encounter, and more powerful muscular action for the purpose of mastication can be obtained. Incidentally arises the thought which has occurred to most of those who take an interest in such matters. How far does the rectangular relationship of the ascending ramus to the body of the mandible depend upon the maintenance of the molar teeth? Is it possible by supplying artificial substitutes to prevent what is usually regarded as the normal obtuse angle in a senile condition? It is well recognised that a similar obtuse angle in childhood gradually becomes a right angle as the molar teeth successively demand room on eruption, and it would be interesting to have recorded the collective experience of practitioners who have endeavoured, by artificial means, to prevent a return to the original shape. The only speaker who alluded to this point in the discussion at the Manchester Society expressed the opinion that it could not be done. If this be correct we must be driven to assume that there is an inherent tendency in the life history of the jaws to approach each other at that period when there is no longer the necessity to continue the building up of new tissues, when even repair commences to fail, and nutritional processes, generally, give evidence having completed their allotted span of function.

Some such assumption might almost be considered an argument in favour of Sir Henry Thompson's statement that the disappearance of the masticating powers is mostly coincident with the period of life when solid animal fibre, which most requires their action, is little, if at all, required by the individual. According to this theory "the man with imperfect teeth who conforms to nature's demands for a mild non-stimulating dietary in advanced years, will mostly be blessed with a better digestion and sounder health than the man who, thanks to his artificial machinery, can eat and does eat as much flesh in quantity and variety as he did in the days of his youth." There is still, however, hope for the dentist, for as Mr. S. J. Hutchinson pointed out, in answer to the above, even the carbo-hydrates demand insalivation which can be best brought about by thorough mastication; and, in addition, Sir Henry himself admitted that artificial substitutes rank among the necessaries of life in a civilised community, for the purpose of vocal articulation to say noing of their relation to personal appearance.

Lady Doctors.—In the year 1878 a plebiscite of the members of the British Medical Association was taken on the question as to whether women should be admitted. Ther was a majority of three to one against the proposal, and a clause, in conformity with this result, was therefore inserted in the articles of the Association. Since that time the number of qualified ladies in the United Kingdom has risen to 135, and a distinct change of opinion has come about. Several Colonial Branches were in favour of the Council reconsidering the rule, and at the Annual Meeting held last year at Newcastle the Bye-laws of the Association were altered by a unanimous vote, thus formally rendering female persons eligible for election. As a result there are already twenty ladies who are now members of the Association.

AN ANTIVIVISECTIONIST BOYCOTT.—The daily papers have contained references to the action taken by Lord Coleridge with regard to the publication of a book about Bacteria, published by the Society for Promoting Christian Knowledge. His Lordship threatened to withdraw from the Society if the volume "Our Secret Friends and Foes," by Professor P. F. Frankland, F.R.S., were not withdrawn. Canon Wilberforce took the same attitude. It was thought that certain passages in the book were calculated to encourage vivisection, and a protest was signed by sixty or seventy people and sent to the secretary. Under the rules of the Society the matter was referred for consideration to the Standing Committee who, having heard the remarks of the author and of the General Literature Committee, are unable to see sufficient reason for withdrawing the book from the Society's list.

CONTAGION IN BANK NOTES.—We do not wish to frighten those of our readers who are the fortunate possessors of bundles of bank-notes; nor to add anything to the recent criticism applied to the Bank of England. We merely draw attention to the investigation carried out by two continental bacteriologists lately. They were anxious to ascertain the microbe-carrying power of bank-notes, and in the case of two which had been in circulation for some time it was estimated that the number of organisms present on each note was over nineteen thousand. Eight pathogenic species were detected, amongst them being germs of tuberculosis, diphtheria, and erysipelas. It is also said that a specific microbe was discovered which had a deadly effect on animals. We are anxious to know its effect upon Homo Sapiens, but at present there appears to be no reason to believe that anyone inoculated with a pure culture of the Bacillus Banknoticus will develop a crop of the genuine flimsy article. After all, the experiments refer to Continental bank notes, which perhaps are scarcely so respectable as our own!

LATE ERUPTION OF TEETH.—We recently published the details of a case recorded by Dr. Weil, in which a canine tooth was not erupted until after the sixtieth year. We hear that another remarkable instance of late eruption has been noticed in the case of a patient under the care of Mr. H. Beadnell Gill. A lady, eighty-three years of age, was wearing an upper and a lower denture. The latter required altering in consequence of the eruption of the two lower wisdom teeth. This did not complete the tale of the patient's woe, for the upper case has now become uncomfortable in consequence of a supernumerary tooth appearing in the place originally occupied by the left upper central. It is a peg-shaped tooth about the size of half a bicuspid, and the bone around it is very dense.

CALCULUS OF THE SOFT PALATE.—At a meeting of the Laryngological Society, Dr. C. W. Parker brought forward a very rare case. When first seen the patient complained of great soreness of the throat, especially on swallowing; sharp pain shooting to the right ear, and some deafness on the same side. The right side of the soft palate was seen to be very swollen, and felt excessively hard and solid. At the base of the uvula there appeared to be a dirty sloughing ulcer, but this turned out to be the free surface of a calculus, the rest being embedded in the substance of the velum. The stone was removed, and when dry weighed fifty-four grains. The concretion was nearer to the uvula than to the tonsil, and so negatived the idea that it might have originated in either the epitonsillar fossa or a tonsillar crypt.

FRENCH AND BRITISH DENTAL CURRICULA.—A statement lately appeared in a Report published in a French Journal, to the effect that the dental diploma granted at the Paris School is recognised over here, so that the holders are excused the special examinations which are a part of our system. This can scarcely be the case. We believe that the College of Surgeons requires such candidates to produce certificates showing an additional twelve months' practice at a General Hospital, and instruction in Dental Mechanics for a like period. M. le docteur Camille Tellier is now on a visit over here, and is taking notes of our teaching organisation and curriculum, in order to be able to make an official report to the French Government.

DEATHS FROM CHLOROFORM.—At an inquest in Birmingham regarding the death of a lad from chloroform narcosis, while some of his teeth were being extracted, the coroner told the jury that out of 7,000 cases of the administration of chloroform there were only two deaths.

Abstracts of British & Foreign Journals.

REMOVAL OF GASSERIAN GANGLION FOR INTRACTABLE NEURALGIA.

Finney (*Johns Hopkins Hosp. Bull.*, October, 1893) reports three cases of removal of the Gasserian ganglion on the right side for very severe neuralgia of the fifth nerve. In each case the operation devised by Hartley and—shortly afterwards but quite independently by Krause—was performed. This operation consists in turning back an omega-shaped flap of skin, muscle, and bone, having a diameter of about 2½ inches, and its base at the zygoma and its apex at at the supra-temporal region. This affords an opening in the skull large enough to allow of a good view of the floor of the middle fossa, and also permits a ready manipulation of its contents. The dura is stripped away from the bone, and, together with the temporo-sphenoidal lobe, lifted up out of the way with broad flat retractors. The foramina spinosum, rotundum, and ovale are thus brought into view, together with the middle meningeal artery, and the second and third divisions of the trigeminus, and lastly, the ganglion itself. The subject of the first case—a married woman aged 47, recovered from the effects of the operation without any bad symptom, but two months later was complaining of stiffness and a sore feeling on the right side of her head, which however, was different in character from the pain felt before the operation. The second patient, who was a man, aged 63, suffered from severe and obstinate vomiting for the first few days after the operation, but subsequently made a good recovery, and up to the time of this report—one month later—had not had the slightest pain. The third patient, aged 69, also a man, died seven hours after the operation, apparently, it is stated, from heart disease, but it is added that the fatal termination was undoubtedly precipitated by the shock of the operation.

H. M. O'Hara, of Melbourne, (*Austr. Med. Journ.*, October 15th), reports a case of trigeminal neuralgia in which he removed the Gasserian ganglion with complete success. The patient was a woman, aged 66, who had been under treatment for five years without permanent result. Her sufferings were unbearable. Having thoroughly scrubbed the face and sponged well with 1 in 1,000 corrosive sublimate solution—a procedure which the patient could not bear without an anæsthetic—O'Hara thoroughly washed out the conjunctival sac with a 1 in 25,000 solution of the same antiseptic, brought the lids together with a horsehair suture, and plugged the external auditory meatus. He then made an incision along the zygoma, over the parotid region, and in front of the ear down to the jaw. This incision was only carried through the skin, and a flap was turned down, care being taken to avoid Steno's duct, and well dusted with iodoform and boric acid. The zygoma was next exposed and divided at its apex and base, and turned downwards with the masseter; this exposed the coronoid process, which was snipped off with bone forceps. The internal maxillary artery was secured between the external pterygoid muscle and the jaw, and torsioned ; the external pterygoid muscle was cut away from its superior attachments and turned down, The sphenoidal spine and the foramen ovale just in front of it could now be felt with the finger. The muscular and fatty tissues could now be cleared away, and the wound being thoroughly illuminated by means of a small electric lamp, the nerve could be seen coming through the foramen. The trephine was applied to the great wing of the sphenoid, a little of the foramen ovale being taken in. The third division of the nerve being caught in a pair of clip forceps acted as a guide to the ganglion, which could be seen to move when the nerve was pulled upon. A curette was next passed over the ganglion and all the contents of the cavum Meckelii were removed, when a slight discharge of cerebro-spinal fluid took place. The parts were well cleansed, and a small strip of iodoform left in the wound for drainage. The zygoma was wired in position and the skin flap readjusted. The time occupied for the whole operation was one hour and ten minutes. Except that the zygoma necrosed, the patient had not a bad symptom. She was discharged fifteen days after the operation, and at the date of the report was quite free from pain. The anæsthesia resulting from the destruction of the ganglion was very well marked, especially on the conjunctiva, the side of the face, and tip of the tongue.

At the Surgical Congress recently held in Rome (*Rif. Med.*, November 7th) Novaro said the first operation of the kind done in Italy was performed by Caponotto, of Turin, by Rose's method ; the patient died of sepsis. At the beginning of 1891 Novaro himself operated on a case of trigeminal neualgia by a slight modification of Krönlein's method, the ascending ramus of the lower jaw being resected in the horizontal direction. He used the scalpel, not the trephine, to the skull, and destroyed the ganglion at its inferior and posterior part, so as not to injure the sinus. The patient was cured. For the last year sensibility, not merely tactile and to heat, but to pain, has returned, with this peculiarity, that the pain now shoots from below upwards. In view of the fact that sensibility thus returns after a time by way of the nerves of cervical plexus, Novaro asks whether an operation of such severity is necessary, or whether the surgeon should not content himself with resection of the second and third divisions of the trigeminus. Salomoni expressed the opinion that, although great difficulties were met with in carrying out Krause's procedure, they were much less serious than those encountered in Rose's method. D'Antona thought it important not to destroy the ganglion entirely in view of the lesions of the eyeball which were almost certain to follow.

Epitome, British Medical Journal.

THE TREATMENT OF INFECTED ROOT CANALS WITH KALIUM AND NATRIUM.

By Dr. Emil Schreier, Vienna, Austria.

This substance consists of kalium and natrium in a metallic state. I pierce its paraffin stopper with a nerve needle at chosen random. You observe a delicate deposit resembling quicksilver on the needle. I now dip the needle in a glass of water ; the needle describes a fiery track therein. In the root canal in question there exists a putrescent mass. This consists of water and the decomposition products of albumen, the latter consisting especially of fats and fatty acids. These substances have been forced by the influences of bacteria and serve as a culture medium for the various species contained therein. If I now introduce my preparation into the canal with the needle, decomposition of the watery contents will occur with development of a considerable amount of heat. Potassium and sodium hydroxydes are formed which in combination with the fat of the pulp form soap. The characteristic gangrenous odour is accordingly changed into a well-marked soapy smell.

A portion of the alkalies possess the well-known property of rendering albuminous substances soluble. Thus any remains of tissue adherent to the walls of the canal are dissolved, the latter become macerated, and access to the dentinal canaliculi is possible sooner than can be affected by any other method thus far employed. Destruction of the organic contents of these canals is now possible. You will readily understand that in consequence of such destruction the disagreeable discoloration which too frequently occurs will be absent and that the lime salts of the tooth proper are in no wise injuriously affected by the treatment. The introduction of the potassium and sodium has the additional effect of destroying the bacteria partly by the heat produced and partly by the new products formed. The contents of the canal have been transformed into a sterile and probably antiseptic mass and thus the development of new colonies of bacteria is prevented ; everything has thus been accomplished which precedes permanent filling of the tooth.

A series of questions will no doubt spontaneously arise in your minds which will take form somewhat as follows: Have any particles of the septic contents of the canal been forced through the apical foramen before sterilization has been complete and so caused infection of the alveoli ? Has the destruction of the bacteria been shown to have been certainly accomplished ? And finally does the preparation adhere to the nerve needle sufficiently to be easily transformed to the canal ?

It will not be difficult to give a satisfactory answer to all these questions. But the results of practice better than mere theoretical deductions demonstrate the groundlessness of such apprehensions. Reports from various sources are at hand as to the results of the preparation in practice. They are all eminently satisfactory, This would be impossible if the infection of the alveoli had occurred in any but the most insignificant proportion of cases. That the bacteria are actually destroyed, I have proved by cultivation experiments. Hardly any one would seriously doubt the possibility of the method practised in affecting the destruction of organic life. I shall probably have an opportunity of expressing myself upon various questions which may be raised in the discussion. It is scarcely necessary to state that this plan of treatment should only be practised with the cofferdam. With proper care the preparation is free from all danger.

A further question may be raised whether the methods heretofore employed do not give such satisfactory results that the introduction of a new one is superfluous. I believe that I am entitled to say that the plan of treatment proposed is founded upon correct principles and meets the obvious indications as regards ease and rapidity of application and certainty of result. It is to say the least the equal of any method. Every practitioner is in a position by its aid to save with rapidity, ease, and well nigh with certainty, teeth that have been seriously affected, and that without special preliminary preparation and without troublesome appliances. Thus the benefit of treatment of the root becomes possible for the masses.

The Dental Cosmos.

TWO CASES ILLUSTRATING THE MORE SERIOUS COMPLICATIONS OF DENTAL CARIES.

(Under the care of Mr. George Lawson.)

These cases serve to illustrate two of the most severe complications of neglected dental caries. In the first the amount of the necrosis was unusually extensive and involved the removal of a considerable sequestrum. In the second case the complication of cellulitis of the neck was a much more serious one, and the risks run, as proved by the ending of the case, were much more grave. In fact, whatever the cause of the suppuration, the condition is one which calls for most active surgical treatment.

Case 1. *Dental Caries; necrosis of lower jaw: suppurative arthritis of tempero-maxillary articulation; partial excision of jaw.*—A woman aged fifty-two was admitted into the hospital on Nov. 8th, 1892, complaining of fixity of the jaw and swelling of the left side of the face. The patient stated that twelve months before admission "lumps" appeared at the angle of the jaw and left side of the face, and at the same time she began to experience difficulty in opening her mouth; this had been gradually getting worse. The swelling of the face had been opened in three places, and a considerable quantity of matter had been let out. The patient was unable to open her mouth for more than a quarter of an inch, and she only did this with difficulty. The second and third left lower molars were found to be carious. There were several sinuses round the angle of the jaw and left side of the face and neck. One of these, directly beneath the zygoma was found to lead down to bare bone. Another sinus was situated about half an inch behind the ramus, and there were two or three more about the angle of the jaw. On Nov. 13th the patient was anæsthetised and the jaw was wedged open; at the same time the last two lower molars were extracted. As the patient was still unable to open her mouth to any extent, she was again anæsthetised on the 30th. A vertical incision was made from just below the zygoma over the ramus nearly as far as the angle, and from the upper end of this incision another passed horizontally forwards just below and parallel with the zygoma. The tempero-maxillary joint was found to be suppurating, and the inferior maxillary bone as far forwards as the inferior dental canal to be necrosed. The bone was disarticulated, the necrosed bone was removed in three pieces, and the glenoid cavity was scraped. The wound at first suppurated freely, but the patient was discharged on Jan. 13th, 1893.

CASE 2. *Dental caries; alveolar abscess; angina Ludovici; septic pneumonia*; *death.*—A rather weakly looking man was admitted into the Middlesex Hospital on April 13th, 1892, with a large tender swelling beneath the jaw The patient gave a history of having felt strong and healthy until two months previously to his admission, when he began to feel "out of sorts." On April 1st he had pain in the first right lower bicuspid tooth, with some swelling beneath the jaw. He obtained some relief from a mixture obtained from a chemist, but the swelling in the neck did not subside, and on the 10th he had the tooth extracted at a hospital. The patient became weak and ill, and the swelling became more painful. He had a shivering fit on the 12th and on the following day was admitted into the Middlesex Hospital. On admission, a red, tense, tender swelling was found extending beneath the whole length of the lower jaw and reaching backwards to the angle on either side. The skin over the tumour was brawny, and fluctuation could be obtained. The breath was very offensive, and on pressing over the swelling fetid pus escaped from the socket of the first right lower bicuspid. The temperature was 102° F., the pulse 120, and the respiration 36. The patient was at once anæsthetised, an incision an inch in length was made in the middle line, and an abscess cavity was opened about one inch below the surface. About an ounce and a half of fetid, brownish-coloured pus escaped. The wound was irrigated with perchloride of mercury, and fomentations were applied. After the operation the patient appeared to be easier, but the temperature and pulse remained the same. On the 14th he complained of pain behind the manubrium sterni. The pulse became irregular in volume and rhythm, and a few crepitations were heard over both chests. The wound was thoroughly irrigated, and three ounces of brandy were ordered. Later the cough became rather troublesome, and the amount of brandy was doubled. During the next two days the patient became very prostrated, and the pulse was weaker, but more regular. There was some dyspnœa, but no cyanosis He could not lie down or sleep for more than a few minutes together. His appetite remained good. On the 17th the pulse became very weak, and dyspnœa was more marked, but no cyanosis was present; the apex of the heart beat lay in the fifth interspace, half an inch outside the nipple line. No friction was heard over the cardiac area ; the pain behind the sternum became more marked ; slight friction could be heard on the right side, and crepitation was just audible over both lungs. The expectoration was more viscid and blood-stained. Half an ounce of brandy was given every hour. On the following day the pulse became weaker, but rather more regular ; the patient became delirious, and his breathing difficult and noisy. He sank and died on April 20th, 1892.

The Lancet.

RACIAL DIFFERENCES IN THE SHAPE OF HUMAN TEETH.

By Dr. F. Regnault.

The shape of the incisor teeth in man varies in different races. In negroes the lateral borders of the teeth diverge from each other while they are parellel in the white races. With Dr. Azoulay's assistance I have taken numerous measurements of the difference in breadth between the neck and free edge of the teeth. The difference is twice as great in negroes than in Hindoos ; it is still more marked in apes.

The same peculiarity of shape is observed in the milk teeth of children; the neck is very narrow but it suddenly enlarges to form the crown of the tooth. The ratio between the neck and the free edge is greater than in the same teeth in the white adult.

In the same way the crown of the canine tooth at its thickest part is larger in proportion to the size of the neck in negroes and other inferior races than in the whites. In apes the canine tooth is thickest at the neck, being drawn to a point differing in this respect from the corresponding teeth in the human subject. It must be admitted, however, that in the lower races of men the canine teeth are very pointed in young subjects before the point has had time to be worn away. These teeth are not so pointed in the white races. Moreover, the canine teeth of the milk set in man present very much the same character as in the ape in so far as they are very slender and possess a sharp point which practically represents the crown. Lastly, the crown of the molars is likewise larger in the lower races. It is said that in the aborigines of New Caledonia, the second molar is frequently as large as the first. This is due to an increase in the size of the crown thus approaching the condition which obtains in the ape, in which the crown of the second molar tooth is comparatively larger than in man.

The Medical Week.

REGULATING CASES.

In regulating cases I strongly object to the idea that patients should attend to their own cases. How are patients to understand more about the nature of the work to be done than we do, who have spent so much time upon the subject. My experience is that if you leave a patient even for a day something happens, and whether you use steel or copper wire there is always the element of ignorance which enters against your knowledge, so that I would strongly advocate the profession looking at the treatment of irregular teeth as a serious matter, not to be entered into lightly.— *W. B. Pearsall.*

THREE SOMEWHAT UNCOMMON CASES OF SALIVARY CALCULI; WITH REMARKS.

By J. W. Hulke, F.R.S.,
President of the Royal College of Surgeons of England;
Senior Surgeon to the Middlesex Hospital.

Salivari calculy in their more usual situation near the buccal end of Wharton's and Steno's duct are very easily recognised; their situation, their very definite figure, and their significant hardness—all of which are readily appreciated through the buccal mucosa—together establish a very high degree of probability of the true nature of the little knot they occasion; and the fluxionary swelling of the gland which they in many instances provoke affords additional proof. Their figure is usually fusiform or oval, and their size small, the length of their longer axis seldom exceeding one centimetre. They occur more often in connection with the submaxillary than with the parotid gland, a circumstance not improbably dependent on the differences in the constitution of the secretion yielded by these two glands. The secretion of the parotid gland is quite limpid, whereas that of the submaxillary gland is glairy, owing to the presence in it of much mucin, a substance which seems to possess considerable binding qualities and to favour the agglomeration of solidifying inorganic salts, like the acacia gum-water used by Messrs. Rainey and Ord in their instructive experiments on the artificial production of concretions. Of the originating causes of the formation of salivary calculi there is little certain knowledge. The precipitation and accretion of urinary salts around foreign bodies detained in the urinary bladder—a circumstance with which all are familiar –have suggested a like origin for salivary calculi. Their very common situation within the main salivary ducts near the opening of those in the buccal mucosa, through which it is imaginable that minute foreign bodies may enter, favours this hypothesis; besides it is well known that in a few instances the presence of a foreign nucleus within a salivary calculus has been actually verified. Perhaps were a search always made for such a nucleus, its presence would be more frequently verified. The diagnosis of a salivary calculus is not quite so easy when it is situated at a distance from the orifice of the main salivary duct, and particularly when it is deeply placed and bedded in the gland substance. Thus, in the third case narrated below, the real nature of the swelling was first discovered in the course of the operation undertaken for its extirpation. Here the remoteness of the calculus from the opening of Wharton's duct makes it unlikely that the minute splinter of woody tissue which had provoked its formation could have entered through this orifice : and it gives probability to the supposition that the splinter passed directly through the mucosa and the intervening tissues into the deep part of the gland. The insidious penetration of the mucous membrane of the floor of the mouth by foreign bodies and the passages of these through the tissues to considerable distances are not very infrequent circumstances. As an illustration of this may be cited the presence of a piece of a blade of grass in an abscess which pointed in the parotid region. On this being shown to him the patient, a farm labourer, said that he had a habit of plucking blades of grass and holding them between his lips. In another instance a piece of straw was found in an abscess that broke in the sub-maxillary triangle. The formation of salivary calculi around foreign bodies lying in the secreting tissue of the gland and not in the efferent duct has its analogy in the deposition of urinary salts upon sutures passed through the substance of the kidneys, a fact which has been experimentally established. The treatment is, of course, in most instances of salivary calculus extremely simple. In many cases the orifice of the duct can be sufficiently stretched with a probe to allow the extraction of the calculus with any small convenient scoop ; and where this cannot be done a small snip with a scissors gives ready access. It is only in exceptional instances that anything more is required. The third case was of this kind ; its deep situation, its prominence in the neck, its consistence and figure, and its evident connection with the hyoid bone led at first to the conjecture that the swelling was a fibroma springing from the periosteum or from the fascial structures attached to this bone, and determined the external excision for its removal. With the experience of this case, marked by so strong a tendency to the renewed formation of stones, the writer would be disposed in like circumstances to advise complete extirpation of the gland.

Case 1. *Salivary calculus near the root of the tongue occasioning an apprehension of cancer.*—A woman, forty two years of age, in robust health, and a great walker, wa sent to me on June 20th, 1882, for an opinion as to the nature of a swelling in the floor of her mouth, the persistence of which had occasioned her anxiety. This was a very definite, hard, moveable, oval knot about 1 centimetre long by 0·5 centimetre wide, lying close beneath the mucosa, between the right side of the tongue, near its root, and the mandible, below which latter it could also be felt externally. She said that one year previously she had had what was then thought to be an "inflammation of the glands of the neck." There was obvious painful swelling. It was feared that an abscess was forming. This, however did not happen. The swelling diminished, it did not disappear entirely; but it returned some time later, and very recently it had much enlarged causing her much local discomfort, and its persistence made her fear that it be might be cancer. The characteristic hardness of the knot, together with its distinct outline and its mobility, implying absence of infiltration into the parts around it, proved it to be a salivary calculus. Assured of its harmlessness, as its removal at the moment was inconvenient, she wished this deferred for a few days. Not long after she had seen me the little stone escaped into her mouth through a small breach in the mucosa. This soon closed, and she remained free from any further trouble in that part. The chemical constituents of the stone were, as usual, calcium phosphate and carbonate, with some animal matter.

Case 2. *Very large salivary calculus producing conspicuous external swelling and giving rise to suspicion of cancer.*—On November 3rd, 1892, I saw a gentleman aged fifty-seven years who was in some anxiety of mind about a swelling in his mouth. In the floor of the mouth, apparently involving the left side of the root of the tongue and passing backwards below the lower end of the anterior faucial pillar, between the tongue and the mandible, there was a considerable swelling, which was also conspicuous externally behind and below the mandibular angle. The mobility of the tongue was slightly hampered, and swallowing was difficult and painful. In the buccal mucosa overlying the swelling there was apparent opposite the wisdom tooth a small orifice from which a little bead of pus was seen exuding. A probe passed through the opening entered a sinus and struck an object so hard that no doubt of its being a salivary calculus was possible. The opening having been enlarged, an oval calculus measuring 3.5 centimetres in its length and 1.8 centimetres in its short axis was extracted. Its surface was tuberculated and indented with s series of sinuous furrows. The patient mentioned that during several years he had noticed a lump in the left side of the neck. Its size had greatly varied, and recently it had become much larger and had been painful, making swallowing rather difficult. After removal of the calculus the surrounding swelling soon subsided, and as yet he has continued to be free from further trouble.

Case 3. *Large salivary calculus formed in relation to the deep part of the submaxillary gland; repeated fresh formation of stones; abscesses.*—On Oct. 7th, 1872, a woman aged twenty-two years was admitted into the Middlesex Hospital bringing with her a note from the "family doctor" stating that he thought she had "ranula." When her head was turned strongly towards the left a swelling of the size of a walnut was conspicuously apparent below the right angle of the mandible in the submaxillary region. When she held her head straight this lump disappeared from view. It moved with the hyoid bone in the act of swallowing. It did not bulge up in the floor of the mouth or push up the tongue, as is usual in ranula, but it could be felt through the buccal mucosa when the finger-tip was pressed down deeply between the root of the tongue and the angle of the jaw. Its consistence suggested a mass of white connective tissue or of cartilage. The patient related that the swelling was first noticed by her about six years previously, and that it had on several occasions swollen so much as to make swallowing difficult and to threaten suffocation ; she also said that these fluxionary swellings subsided upon the occurrence of a discharge into the mouth. The above physical characters, and the anatomical relations of the swelling, did not well accord with "ranula." The recent suffocative attacks urgently required the removal of the tumour—assuming this to be their cause ; and its connexion with the hyoid bone indicated that its extirpation could be better effected through an external incision in the neck than through the mouth. On Oct. 10th the tumour was dissected out. Its isolation was unattended with difficulty, except at its deep surface, which was found to be firmly attached to the great cornu of the hyoid bone. In detaching from this latter the deep part of the tumour the edge of the knife was unexpectedly arrested by a stony mass, which proved to be a salivary calculus enclosed in a thick fibrous capsule blended with the enlarged and indurated deep point of the submaxillary gland. The wound soon closed, and the patient went home on the 25th. The calculus weighed

76 grains. Its outline was roughly trihedral. Its outer surface was finely tuberculated and convex, and its deep surface was smooth and hollow. A section showed concentric zones of deposition around a small central black speck, which proved to be a minute fragment of woody tissue. Upon interrogating her the patient replied that she had never been aware of a splinter of wood getting into her mouth, and she added that she and her people had attributed the occurence of the swelling to a blow on the neck by a snowball. Six years later, on Nov. 25th, 1878, the patient re-entered the hospital, having then, occupying the submaxillary triangle, and also extending downwards below it,a tender,red,œdematous swelling in which there were two openings discharging pus. The swelling moved with the hyoid bone in swallowing. She said that after the operation in 1872 she remained free from any inconvenience during four years, at the end of which time an abscess again formed, which broke near the angle of the jaw. Later some small stones were discharged from this opening. At the end of one year this abscess closed, but three months subsequently it reopened, and it had not since closed again ; a little matter daily escaped from it. The other opening, which was lower than that just mentioned, was made, she said, by a surgeon one week before she re-entered the hospital. Both these sinuses were laid open, and another calculus—1·5 centimetres long by 1 centimetre wide—was extracted. They were then thoroughly scraped wtth a sharp scoop. On Dec. 19th, the wound being then nearly healed and quite superficial, she was allowed to return home. Seven years later, on Dec. 21st, 1885, the patient again returned to the hospital. She now had a very considerable swelling involving the entire submaxillary triangle from the sterno-mastoid to beneath the chin, reaching also below this down to the level of the lower border of the thyroid cartilage, and likewise ascending behind the mandibular ramus towards the ear, the skin was red and fixed, and swallowing was difficult. The tongue could not be fully protruded ; its normal mobility was lessened, and its dorsum was thickly furred. The right faucial parts were congested and very swollen. Most of the teeth on the right side were wanting. The patient mentioned that after leaving the hospital in 1878 the wound continued healed, and she experienced no trouble in the part for four years, when swelling returned, an abscess broke, and small pieces of stone were noticed in the discharge. On Dec. 22nd, the day following her re-entering the hospital, an abscess

broke. Next day this was thoroughly opened up, and two calculi—the larger of the size of a haricot bean—were removed. Through the cavity enclosing them the external wound was now found to communicate freely with the floor of the mouth through an ulcerated opening in the latter. These measures were followed by speedy disappearance of the inflammatory swelling, and on Dec. 29th, by which time the external incision had nearly closed, she was permitted to go home. The faucial swelling had entirely subsided, and the tongue had become freely mobile.

The Lancet.

Reports of Societies.

MANCHESTER ODONTOLOGICAL SOCIETY.

The usual monthly meeting of the members of the Manchester Odontological Society took place on Tuesday evening, the 5th inst. at the Grand Hotel, Aytoun Street. Mr. P. Murphy, the President, in the chair.

NEW MEMBERS.

The following gentlemen were balloted for, and elected members of the Society:—

Mr. Charles Howard Carrington, L.D.S. Glas., 21, Greek Street, Stockport, and Mr. William Fisher, L.D.S. Eng., 9, Lowther Street, Kendal.

CASUAL COMMUNICATIONS.

The PRESIDENT exhibited a pair of pliers he had had made similar to the kind used by Dr. Patrick in his recent demonstration before the Society. He also showed a maxilla, which had been taken from beneath the ruins of an old abbey, near York. They would observe that the bone was that of a young person, and that the teeth were quite perfect. It was thought to be at least a thousand years old.

Mr. EDWARD LUND, F.R.C.S., then read a paper on "The development, growth, and condition of the teeth as a test of health," which we publish on page 49.

DISCUSSION.

The PRESIDENT, in opening the discussion, said they were extremely indebted to Mr. Lund for his kindness in coming amongst them that evening. The address he had given them was full of matter for reflection, and he hoped that a good discussion would take place.

Mr. G. G. Campion said the difficulty was that the material of the paper was so important that very few of them would be able at a moment's notice to answer as fully as Mr. Lund would like, the many pertinent questions with which he had concluded his paper. One question was : "Is the extraction of the primary temporary teeth the cause of any contraction or ill-development of the dental arch?" Well, that question had been debated for years one might say, and he thought the general conclusion which had now been arrived at was that the extraction of the temporary teeth did not in any way interfere with the development of the maxillary bones; but he could call to mind one or two cases where the extraction of one or more of the temporary molars had led to the contraction of the dental arch, not through the ill-development of the bones of the jaw, but by the moving forward of the six year molars. Another question Mr. Lund asked was, "Are inflamed gums the cause or effect of dental caries?" He (Mr. Campion) should unhesitatingly say that inflamed gums—and he took it that Mr. Lund was referring to superficial inflammation—(Mr. Lund : Yes),—were not the cause, but the secondary effect of dental caries. He said "secondary effect" because he thought they would all agree that it was produced not actually by the caries itself, but by the caries rendering those teeth so sensitive, that mastication by them was impossible. Mr. Lund had alluded to the opinion of some American dentists, on the influence of hot and cold fluids on the teeth being sometimes the cause of caries. He himself thought that opinion was on a par with some others which those versatile and imaginative gentlemen inundated them with. Those who were in the habit of drinking iced water, always in its passage through the mouth avoided letting it touch their teeth, by shielding them with the tongue, otherwise the effect was decidedly unpleasant. Therefore it seemed to him that the hot and cold fluid theory was not worth consideration. Mr. Lund also asked "Did caries attack the upper more than the lower teeth?" He alluded particularly to the front teeth. He (Mr. Campion) thought all present would answer the question in the affirmative, but that they would all demur to the explanation, put forward by Mr. Lund, that it was due in some way to the blood supply. They would attribute it rather to the fact that the lower front teeth were more or less in a pond of alkaline saliva which prevented their decay. In conclusion, Mr. Campion said they were all deeply indebted to Mr. Lund. His paper was one which they would read in their transactions with a great deal of interest and profit (applause). He was deserving of the hearty thanks of the Society for the kindness he had done them that evening. (Applause).

Mr. David Headridge said he wished they had more papers such as they had heard that evening, affording them as it did such an excellent field for reflection and observation. The only difficulty was to adequately discuss the points it raised, in one evening. One point Mr. Lund had mentioned, namely, that of the neurotic conditions of teeth, which he (Mr. Headridge) would like to refer to. Such conditions were, he believed, associated with higher civilisation, and the higher the civilisation the more contracted was the type of arch. Another point was with regard to the relation of mental development with delay in the appearance of the teeth. He had been very much struck with some cases that had come under his own observation, where the delay in the eruption of the secondary teeth had been remarkable. The children in question had been enjoying all the advantages of a country life and everything else which should have led to a strong physical development. They had, however, been hard worked mentally, for examination purposes, and their teeth had been late in erupting, and in one case, a girl of 15, she was only just beginning to erupt her canine teeth, all her other teeth being equally late. Such a condition, of course, produced troublesome irregularities. He thought there was an intimate connection between health and good teeth, and it was the bounden duty, he considered, of medical men to advise parents to send their children to the dentist to have their primary teeth attended to. Another point Mr. Lund brought out was the correlation that existed between the teeth, the hair, and the nails, and this was in agreement with the results of enquiries he (Mr. Headridge) had been making into this subject.

Mr. W. A. Hooton said he felt rather diffident about running atilt against a lecturer in dental surgery, but there was one point on which he differed from Mr. Campion, and that was in saying that they did not get caries sometimes secondary to inflammation of the mucous membrane of the mouth. They knew that they often got an inflamed gum edge as a result of a cavity extending beneath the gum, but on the other hand the process might be reversed. He had lately had a case of a patient who had been suffering from syphilis. He (Mr. Hooton) thought he had been badly treated, as the secondary symptoms had been very pronounced, and the oral mucous membrane had suffered severely, and round almost every one of his teeth, just at the gum edge, there was a ring of caries. In this case it seemed clear that the caries had been induced by an inflammation of the gum. He did not know that they as dentists thought that the upper teeth were more subject to decay than the lower ones, excepting of course the lower front teeth.

He thought that symmetrical caries could be accounted for by the fact that when any arrest in development took place, it affected the teeth symmetrically. He thought it was very kind of Mr. Lund to come among them and allow them to criticise his paper—contrary to the usual rules of the Society in case of visitors—but it had been of great benefit to them. (Hear, hear.)

Mr. Minshall instanced the case of a patient of thirteen years old, whom he saw in July last, and who had then no signs of the twelve-year old molars coming through the gums. He saw her again on Saturday, the 2nd inst. He then found the right lower twelve year old molar was about half covered by the gum and the other half was exposed, and upon examining it he found in it a fairly large cavity, due, he thought, to superficial inflammation. He quite agreed with Mr. Campion that the upper teeth decayed a great deal faster in a mouth where the saliva was very acid, than the lower front teeth.

Mr. G. G. Campion, interposing, said he did not think there was really any difference between himself, Mr. Hooton, and Mr. Minshall, in regard to the question of inflammation. They only differed as to whether it was a primary, an existing, or a conditioning cause, and he quite agreed with the gentlemen in question, that the inflammation of the gum might be grouped under any one of those heads, say the conditioning cause, because it had been proved that the active existing cause of caries, was fermentation, due to the presence of bacteria.

Mr. P. Headridge said he was much struck with the manner in which Mr. Lund referred to the eruption of the first teeth. He showed that if they had a delicate temporary tooth there was invariably a deficiency of mastication on the surface of the tooth. There was no doubt that frictio was wanted to fully develop the teeth in the mouth, and to lift them clear of the gum. He could quite understand that a soft, spongy gum that would form a pocket to receive the acid must of necessity cause the erosion of the teeth. But if they had a hard gum they had the tongue keeping the surface clean and no decay took place. He always in his practice got the gums healthy before filling the teeth, or otherwise the filling would give way owing to the unhealthy condition of the gum. In order to keep them healthy in childhood they wanted a certain amount of friction, and that they could not have if the teeth were tender, as the tongue would cover the part that was tender. They must keep the child from suffering pain, or else, through want of friction, they would find the six-year-old molar decayed when it came through the gum. As a general rule, the teeth in a V-shaped arch were delicate, although he had had cases of a V–shaped mouth where the teeth were to all appearances well-developed and strong teeth.

The PRESIDENT said that so far as his experience went he often found the lower six-year-old molars in position long after the upper ones had gone. Even when they were removed it was not always through caries, but through the accretion of large masses of tartar on the gum or the loosening of the alveolar process. Too much importance could not be attached to the preservation of the deciduous teeth. Medical men ought to educate their patients to take their young children to a dentist when there was any complaint with regard to the teeth. He himself had filled the four deciduous molars of a little girl only four years old, and he had no doubt those teeth would last until they were erupted by their successors. He quite agreed that where they found caries in one tooth they would find it in the corresponding tooth on the opposite side. In cases also where teeth were removed in early life, they should be removed symmetrically.

In moving a vote of thanks to Mr. Lund, the President said that although he had been a member of that society for many years, he did not think he had ever listened to a paper which had interested him more than the one that evening.

This was seconded and carried with applause.

Mr. Lund, in reply, said the greatest return they could possibly have made to him was the vote of thanks which they had just passed. The criticisms they had passed upon his paper showed they had listened with great attention to what he had said, and he thoroughly appreciated their criticism.

Dental News.

THE EDINBURGH DENTAL STUDENTS' SOCIETY.

The second meeting of the present session of this Society was held on the evening of Monday, December 4th, when a discussion on "The Journal of the British Dental Association for November," was opened by Messrs. B. Lindsay, A. Shennan, and M. J. Malcolm, L.D.S. The other speakers were Messrs. J. Graham Munro, L.D.S., J. Norris Stewart, Paterson, J. K. Macintosh, and Miss Murray. The varied articles were keenly discussed, the members unanimously condemning the recent action of the Irish College anent the mechanical apprenticeship, and by a majority disfavouring the petition of Mr. Blandy to the Medical Council.

On the following Friday the Annual Dance took place in the Windsor Hotel, Princes Street, Mrs. Bowman Macleod, Mrs. Stewart Durward, and Mrs. Stewart, acting as chaperons. A most enjoyable evening was spent, the music being excellent, and the stewards, Messrs. Turnbull, Goldie, Robertson Campbell, and Logan most assiduous in their attentions to the company.

APPOINTMENTS.

Arthur Cocker, L.D.S. Irel. and Edin., has been appointed Dental Surgeon to Shibden Industrial School, Halifax.

W. R. Wood, L.D.S.R.C.S., has been appointed Dental House Surgeon to Guy's Hospital.

To clarify wax, melt in hot-water bath ; then remove from water bath and bring to a slow boil on the stove. Into the boiling wax break a fresh egg, and stir three or four minutes till the egg is thoroughly cooked. Strain through a piece of cheese cloth, to remove all pieces of egg, and you will have your wax as clean and pure as when brought from the dental depot. *J. E. Harvey.*

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

A CORRECTION.

To the Editor of the "British Journal of Dental Science."

SIR.—Will you allow me to state that I am not responsible for the incorrect description of my qualification on page 7, of your issue of Jan. 1st, which should have read "L.D.S.I.," instead of "L.D.S. Eng."

I am, yours truly,
FREDERIC W. MINSHALL.

Manchester, Jan. 4, 1894.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
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British Journal of Dental Science.

No. 625. LONDON, FEB. 1, 1894. Vol. XXXVII.

ON THE PHYSIOLOGY OF THE HEART IN RELATION TO ANÆSTHETICS.*

By John W. Pickering, D.Sc. (Lond.)

Although many brilliant investigators have devoted much time and energy to the study of the physiological action of anæsthetics on the heart, there are many questions still undecided, and the controversy as to the part played by the heart in deaths resulting from the inhalation of anæsthetics shows but little sign of abatement.

Since I propose to treat the subject from an experimental standpoint, it is necessary to remark that it is unwise to deduce generalisations from a single series of animals. To illustrate this I will cite the recent experiments of Professor Halliburton, who, working with a toxic substance termed nucleo-albumin, has found that albino rabbits are far more resistant to the fatal effects of this substance than are darker animals of the same species.

This "individual idiosyncrasy" in response to the action of drugs which may occur in any group of animals, has not improbably led to the discordant conclusions of different observers, who have limited their experiments to single groups of animals, and have disregarded the results recorded by other experimenters and clinicians. The following are some of the possible modes of action of anæsthetics on the heart.

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* Read before the Odontological Society of Great Britain.

(1) The anæsthetic acts on the cardiac muscle itself, and may directly paralyse its contractile power.

(2) That the paralysis of the heart, when present, is due to the action of the anæsthetic on the intrinsic cardiac nervous mechanism.

(3) That chloroform syncope is due to a reflex cardiac inhibition caused by irritation of the nerve endings of the vagi in the lungs.

(4) That chloroform primarily paralyses the respiratory centre in the medulla oblongata, and that the consequent asphyxial condition of the blood secondarily paralyses the heart.

(5) That cardiac dilatation, when present, is due to pulmonary obstruction, and that chloroform has no specific action on the heart.

This last view, advocated by Lawrie (1), has been rendered improbable by the experiments of McWilliam (2) and others, who have shown that chloroform will produce dilatation of *both sides* of the heart.

It is obvious that many of the difficulties of the problem are due to the presence of the nervous system of the animal undergoing experimentation. Gaskell and Shore (3) have, by the establishment of a cross circulation between two animals, allowed the blood of an animal inhaling chloroform to circulate through the brain only, and not through the heart of another animal, and have by this means studied the action of chloroform on the heart *via* the nervous system.

Conversely, they have allowed the blood of an animal inhaling chloroform to circulate through the heart of a second animal without passing through its brain. They have concluded that chloroform has a powerful action on the heart itself. But even in these experiments the intrinsic cardiac nervous mechanism (viz., the nerve cells and nerve endings of the heart) remains intact, so that we have a possibility of the anæsthetic acting on the heart through chemical stimulations of the cardiac termination of the vagi.

I have attempted to eliminate this difficulty by experimenting on the hearts of embryos previous to the development of a functional nervous mechanism. The chick embryo between the 20th and 80th hour of incubation presents us with an accessible form of heart minus a nervous system.

Although at this period of development the embryonic circulation is very active, there can be no complication due to a change of blood-pressure. Also the factor of asphyxia is eliminated, except when purposely introduced, by placing the embryo in an atmosphere of carbonic acid.

But it will be asked what evidence is there that the heart at so early a stage of its development is influenced by drugs in like manner to the adult heart? I have made a large number of experiments to test this question, the details of which are published in recent numbers of the *Proceedings of the Royal Society* and the *Journal of Physiology* (4).

From experiments made on a large number of animals, both vertebrate and invertebrate, it has been concluded that digitalin, caffeine, strophanthin, and veratrine act directly on the adult heart muscle. The typical action of each of these drugs is so well shown on the embryonic heart that it is possible to recognise their dilute solutions by their physiological action alone.

There is therefore evidence that in the embryonic heart we possess a convenient means of determining whether a given drug acts directly on the heart or through the agency of a nervous mechanism. We can easily experiment with chloroform, ether, or nitrous oxide, either pure or mixed with air, oxygen, or carbonic dioxide. We can also test the action of drugs on hearts that have been stopped by anæsthetics, and thus get some indication of that great desideratum—a drug which will antagonise the toxic action of anæsthetics on the heart.

I should here mention that all my experiments have been made on hearts *in situ*, and under conditions such that their rhythms are maintained for many hours unchanged, provided that no stimuli, either chemical or physical, be applied to them. With chloroform and ether I have obtained widely divergent results.

Thus one half a cc. of a chloroform solution containing ·00003 cc. of pure chloroform will, if injected under the blastoderm of the embryo, rapidly reduce its cardiac rhythm and produce an exaggerated diastole. After the injection of .0004 cc. the heart stopped in an extremely dilated condition, but the auricle gave a few twitches in response to mechanical stimuli.

Ether, on the other hand, acts as a powerful stimulant to the embryonic heart. Thus a heart whose action had been stopped by exposure to cold was restored to its normal rhythm by the injection of ·003 cc. of ether dissolved in 1 cc. of normal saline. It is only after comparatively enormous doses that ether can depress the cardiac rhythm of the chick embryo. These experiments show that chloroform and ether have an essentially different action on the embryonic heart—that chloroform has a depressor and ether an augmentor action—a conclusion at variance with the view of Claude Bernard (5) reiterated by the Hyderabad Commission.

Nitrous oxide and air in a mixture of 70 per cent. of N_2O and 30 per cent. of O has but little depressant effect on the embryonic heart. Pure nitrous oxide after several minutes' action stops the embryonic heart in diastole. A mixture of 70 per cent. N_2O and 30 per cent. of CO_2 rapidly stops the heart's action after 30 seconds' exposure.

A mixture of 70 per cent. of N_2O and 30 per cent. of O stimulates the heart. The heart's action is unimpaired after several hours' exposure to this mixture.

Hearts that have been stopped by the above-named mixture of N_2O and CO_2 can often be restored by the passage of a current of oxygen over them.

A mixture of carbonic acid and chloroform is far more toxic to the embryonic heart than a mixture of chloroform and air. I have failed to restore hearts stopped by chloroform with oxygen.

Raising the temperature of the embryo still in an atmosphere of chloroform or nitrous oxide will usually restore the stopped cardiac rhythm. This restoration is more difficult when there is a large percentage of CO_2 present.

I am therefore of opinion that CO_2 increases the toxic power of chloroform and nitrous oxide on the heart.

The conjoint action of the carbonic acid and chloroform during failing respiration which has been emphasised by Dr. Brunton (6) is worthy of consideration. It has also gained additional interest owing to the recent researches of Oliver and Garrett (7) on the tension of gases in the blood during anæsthesia.

They have found that during chloroform narcosis there is a tendency for the amount of CO_2 to increase, and the amount of O to diminish.

A mixture of Brin's "oxygen," which contains 7 per cent. of nitrogen, when given with chloroform delays the appearance of anæsthesia and may induce temporary apnœa. The increased oxidation of the tissues causes an excess of CO_2 to be present in the blood, which is, however, scarlet owing to the large amount of oxyhæmoglin present.

In cases where large doses of the anæsthetic stopped the respiration, the heart continued beating.

Thus there is apparently with the administration of oxygen and chloroform less danger of cardiac stoppage than with chloroform alone.

With nitrous oxide alone there was found a marked decrease of oxygen, *but no excess of carbonic acid.*

These observers wrote : " So far as N_2O anæsthesia was concerned, the danger probably depended on the great absence of oxygen, for the carbonic acid was present in small quantities compared with that in other anæsthetics, but was present in a very large quantity relatively to the amount of oxygen associated with it in the blood."

I therefore understand that Oliver and Garrett apprehend a source of danger in nitrous oxide anæsthesia owing to the lack of oxygen in the blood.

Haldane and Lorrain-Smith (8) have, however, made experiments on human beings as to the effects of an excess of CO_2 with or without a deficiency of oxygen on the respiration and pulse.

They, like Hermans and Miescher, have observed that an excess of CO_2 will induce hypernœa more readily than a deficiency of oxygen.

Hypernœa begins when the CO_2 exceeds 4 per cent. of the atmosphere breathed. An atmosphere containing 10 per cent. of CO_2 will produce extreme distress, followed by frontal headache and often by vomiting. If the percentage of CO_2 be raised to 18 per cent., the respirations are rapidly stopped.

Hypernœa does not set in till the percentage of oxygen has fallen to 12 per cent. of the atmosphere breathed, provided that the carbonic acid be removed. It therefore seems that the deficiency of oxygen in nitrous oxide anæsthesia is not a source of danger, and it may be a question worthy of discussion whether the conjoint administration of oxygen in nitrous oxide anæsthesia by an increase of the amount of CO_2 in the blood may depress rather than aid the organism ; whether it is not better to ventilate the lungs with air which will tend to remove the CO_2 without stimulating the production of an excess of CO_2.

On the other hand it must not be forgotten that oxygen has a stimulant action on the heart, Klug (9) Fano (10).

We must now pass to the vexed question as to whether nitrous oxide forms a compound with any of the constituents of the blood, or whether its action is owing to the formation of reduced hæmoglobin and consequent deprivation of the tissues of oxygen. The deficiency of oxygen in N_2O anæsthesia seems to point to this at least playing some part in its action.

Dr. Dudley Buxton (11), contrary to the opinion of Dr. MacMunn (12), has urged the probable formation of compound of nitrous oxide with hæmoglobin, or with some globulin of the plasma.

The recent researches of Christian Bohr (13), who has shown that carbonic acid probably forms a compound with the hæmoglobin of the blood, and the researches of Dr. A. E. Wright (14), which point to a *role* played by CO_2 in the chemical compounds formed by the blood plasma, lend much probability to Dr. Buxton's views, and emphasise the danger of conclusions drawn from negative spectroscopic results. The question must be, however, left *sub judice*. The importance of the existence of a compound of carbonic acid and hæmoglobin is obvious in its relation to anæsthesia, for we have to deal with a new compound in the blood and not with merely dissolved carbonic acid or carbonic acid combined in the plasma as sodium hydrogen carbonate.

This substance may account for an excess of CO_2 being more noxious than a deficiency of oxygen.

We have now to consider if it may be possible to pharmacologically antagonise the depressant action of anæsthetics on the heart.

Dr. Ringer (15) found that if a frog's heart had been stopped by chloroform, the application of a 1 per cent. solution of ammonium hydrate directly to the ventricle will restore the heart's beats almost to their original power.

I have tested this antagonism on the embryonic heart, and find that in hearts stopped in extreme dilatation by chloroform, the application of ammonia will partially restore their rhythm.

Dr. Wood (16), of Philadelphia, has attempted to antagonise the action of chloroform on dogs' hearts. He failed to get any restoration of rhythm by the hypodermic injection of either atropine, amyl nitrite, or caffeine, while alcohol only increased the cardiac depression. Ammonia had slightly beneficial effects, and digitalis, by raising the blood pressure, often averted death.

Caffeine and atropine failed to restore the cardiac rhythm of the embryonic heart after a stoppage produced by chloroform.

I have also not obtained marked results with digitalin, but on this point, and on the action of strophanthin on chloroformed hearts, I hope to make further experiments.

Possibly Wood's results with digitalin may be explained by the vaso-constrictor action of that substance.

Strychnine, in doses of ·00002 gram, increases both the force and frequency of the embryonic heart rhythm. Larger doses are, however, very depressant. Strychnine is well known to have a stimulant action on the respiratory centre in the medulla oblongata. Hence it will promote the recovery of a failing respiration, which, if increased, will help to remove the anæsthetic and carbonic acid from the lungs of the person or animal.

There is, therefore, a physiological *rationale* for the use of strychnine in chloroform syncope. Some have suggested the use of interrupted electric current to restore the heart stopped by chloroform.

Chloroformed hearts will, if not too strongly poisoned, respond to electrical stimuli. We must, however, not forget the observations of McWilliam, who has shown that under certain conditions, the effect of a local application of an interrupted current to the heart is the production of an arhythmic fibrillar contraction of the heart-muscle termed "delirium cordis," and not the production of the normal cardiac rhythm.

I have found that the direct application of heat will often restore a chloroformed heart when chemical and electrical stimuli fail. I shall, therefore, venture to ask if you have tried the application of external heat in the form of hot wet rags over the heart in cases of chloroform heart-failure. From the experimental standpoint, and from its great simplicity, it might not be unworthy of trial, at any rate, in conjunction with other means of restoration.

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OBTURATORS AND ARTIFICIAL VELA.*

By Mr. J. S. MacFarlane.

Mr. President and Gentlemen,—I ask your kind attention for a short time this evening, and I will endeavour to describe the practical treatment of the various lesions of the palate by means of obturators and artificial vela, specimens of which I will pass round for your examination.

A student's experience of such must be very small, therefore I ask you not to expect from me to-night anything like an exhaustive or original paper, but I will try and describe to you the general principles adopted, to the best of my abilities.

First, I will briefly describe the origin of the various lesions of the palate, from which I will select a few examples to illustrate their treatment.

Cleft palate has been said to arise from one of two causes :

1. Congenital. 2. Accidental.

Congenital dating from birth, its origin being an arrest of development. *Accidental* being the result of accident or disease.

Cleft palate is almost always congenital, there being a longitudinal fissure of the palate in the median line, never elsewhere, and always a fissure, whilst in cases of injury to the palate by accident, or disease, the loss consists sometimes of a simple perforation, at other times, it may involve the destruction of the velum, a considerable loss of the palate bones, vomer, turbinated and maxillary bones, also the loss of a greater or less number of teeth. A fissure of the palate would naturally be supposed to affect primarily, deglutition, but upon close examination, it has been shown that, in the adult, deglutition is not impaired, the regurgitation of fluids or solids being very rare. Also the position of the infant's head in taking food is favourable to deglutition, and before many years have elapsed, it has learned to overcome the inconvenience or difficulty of swallowing. Accidental lesions, on the other hand, which occur generally in adult life, produce very great inconvenience in this respect.

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* Read at the Students' Society, National Dental Hospital.

In both cases, whether accidental or congenital, the faculty of distinct articulation is seriously impaired, which impairment demands the interference of Science and Art.

Therefore the remedy for such must be the closing of the abnormal passage by some means which will restore to the deformed organs their functions. The operation of staphyloraphy is still held by some to be the only treatment that such cases should receive.

The reason why it is generally a failure is because the newly formed septum is rigid, tense and deficient in length, and in the majority of cases the soft palate cannot be brought into contact with the pharyngeal wall, and imperfect speech naturally follows.

Now all apparatus applied to the roof of the mouth come under the head of Artificial Palates, these being divided according to their respective uses into obturators and artificial vela.

An obturator is defined by Kingsley as a stopper, plug, or cover, hard, non-elastic and stationary, fitted to an opening with a well defined border or outline and shutting off the nasal passage. Such are applicable to perforations of the hard or soft palate, resulting from accident or disease, but are rarely applicable to congenital fissure of the velum.

An artificial velum is not a stationary stopper, but an elastic moveable valve, under the control of the adjacent muscles, closing or opening the passage at will, and is especially applicable to congenital fissures, occasionally where the soft palate has been destroyed, but never to perforations of the hard or soft palate.

The first definite suggestion of an obturator was in the 15th century. It consisted of a plate of silver or gold a little larger than the perforation itself, to the upper surface of which was attached a piece of sponge, which when moistened became swollen, and filled up the concavity of the palate, and thus held the plate in position. The loss of speech would be instantly restored, but in time the pressure of a foreign body upon the adjacent tissues produced absorption, and the perforation thus became larger. This principle with some improvements was adopted up to the 17th century, when Bourdet, who recognised the evil of wearing an instrument in a cavity, or aperture, devised a plan of arching over the perforation by thin sheet metal, supported by clasps round the teeth, which principle is carried out up to the present day.

Delabarre also constructed a somewhat formidable apparatus, consisting of an obturator and velum combined.

Beyond these, we hear of nothing with any scientific principles until we come to the time of Snell and Stearn. Snell's was the first case on record of attempting to remedy the evil of congenital fissure by an artificial velum; the previous cases I have quoted being for the relief of accidental lesions only. Still later we find record of a paper being read by Sercombe in 1857, describing his velum as consisting of two pieces of rubber, the larger piece extremely thin, and the smaller much thicker. These pieces were sewn to the posterior margin of a gold plate, perforated for the purpose. Next we have an instrument introduced by Kingsley, constructed on similar principles to that of Stearn's; also in taking the impression he used plaster of Paris, and vulcanized his elastic velum in moulds made of metal.

Lastly, Suersen in 1867 described an obturator in which he announced a principle in the mechanism of speech with an artificial organ, which had never been before advanced.

Specimen 1, is a model showing a perforation of the hard palate, to which is struck a plate with suitable clasps round the teeth. The plate, as will be seen, extends some little distance beyond the borders of the perforation, in order that the perforation should be completely covered. This plate prevents the passage of food and air into the nasal cavity, but in no way must the obturator pass through the opening, but simply extend across as in the specimen. In cases where the perforation of the hard palate is occasioned by the loss of diseased bone, the obturator should be applied as soon as possible after the sequestrum has come away, and while the wound is in a state of active granulation, the granulating edges are supported and protected from being bruised by food and the orifice rapidly contracts.

Also in cases where a portion of the floor of the antrum is lost by necrosis, or in cases of severe abscess of the antrum, the orifice should be immediately spanned over, in a similar way to that just described, the result in many cases being a development of a membranous growth supplying the lost bone.

In taking the impression for such cases, be sure and place a piece of goldbeater's skin, or some other thin material, to prevent the impression being forced through to the nasal cavity, and thus rendering the impression difficult to withdraw.

Specimen 2. Shows an obturator, applied to a perforation of the soft palate. These perforations are very rare. The apparatus employed is somewhat different to the former, in that the obturator itself is of a moveable nature, to follow the movements of the soft palate. The main plate extends back as far as the posterior edge of the hard palate, and a vulcanite obturator is made to fit into the perforation, having a flange to lie upon the superior surface of the soft palate to prevent it dropping out of the perforation, and is attached to the main plate by means of a piece of metal and a hinge. The impression in this case might be taken in plaster, in order to obtain the proper angle at which the hinge should be placed being sure to cover the preforation previous to taking the impression. In other words, one gets no disturbance of the soft tissues by taking a plaster impression, and thus a true model is obtained to work to.

Specimen 3. Shows an apparatus for the complete destruction of the soft palate, the plate extending as far back as the posterior edge of the hard palate, and to which is attached an apron of soft rubber, by means of gold or Platina wire. In such a case as this it is not necessary to take a plaster impression, as a representation of that part of the tissues behind the hard palate is not required. The impression may be taken in the ordinary way, it only being necessary to take the hard palate. To this impression cast a plaster model, to which model the main plate can be made and finished. Then to the posterior edge of the plate, attach a piece of gutta-percha to represent the soft palate, try in the mouth and ascertain its size, length, position, etc. Having satisfied yourself with regard to the latter, detach the gutta-percha from the main plate, and vulcanize in soft rubber. In the specimen, I used Silicate of Soda to produce a smooth surface, with a fairly good result. Before sinking the gutta-percha in the flask, its edges should be made as thin as possible, so as to yield to the tissues, with which it may come in contact.

In such a case as this, the patient would have to educate the muscles of the pharynx to do the work of closing the passage of the nares. In acquired lesions the patient does not find it very difficult to educate the muscles to a new work, because at some former time he has had the power of distinct articulation.

Specimen 4. Shows an example of treating Congenital Fissure of the palate by means of an artificial Velum. It consists of a main plate which should extend as far back as the edge of the hard palate, in order to attach the velum; suitable clasps are attached to retain the apparatus firmly in position. The velum itself is made in one piece, fastened to the main plate by means of a pin with a large head, over which it is forced, both perpendicular and horizontal movements being provided for.

To take the impression, first take a rough impression with an ordinary tray, using wax or any of the well known compositions. Cast a plaster model and make a special tray extending it back in the line of the soft palate. Sheet zinc is as good as any material to use, being both cheap and easy of adaptation. By making a special tray two advantages are gained.

1st is even pressure and perfect adaptation upon the surface to be moulded.

2nd. The absence of any superfluous wax.

Now the material I should advise using is A1. composition, as this sets more rapidly than other compositions. Having lined the tray sufficiently with the A1 apply it to the patient's mouth and press it well up. Some of you no doubt will say why not take a plaster impression. I myself do not understand why the patient should be burdened with plaster, in that it is very difficult of manipulation as well as being nauseous to the patient. True it takes a more accurate impression than composition, but if the velum is to be tried in previous to finishing the case, any alteration can be made then.

The only case where one is justified in taking a plaster impression, is where the superior surface of the maxillary bones is required to support the case, or where the case has to rest upon the nasal fossæ.

With regard to taking a plaster impression, if such is required. We will suppose a special tray has been made; next cover the tray with plaster, having only a thin film at the back, as the impression of the borders of the fissure is only required, and not to let the plaster enter the fissure. Having taken this impression, the next thing is to fill the fissure with soft plaster down to the borders of the fissure, and whilst in a soft condition, carry the palatal impression against it, and let remain until the plaster has set, then withdraw and the plaster in the fissure will remain, and can easily be removed afterwards with a pair of strong tweezers, by a downward and backward movement. Previous to inserting the palatal impression, that part which will come in contact with the plaster in the fissure should be painted with a solution of soap, to prevent it adhering. When casting the model, it should be cast in sections similar to the models I am about to pass round. First, cast as far back as the hard palate, then cast two lateral sections and one posteriorly, thus enclosing the whole of the fissure. The advantage of casting in sections is that the velum, when made up, can be easily removed.

In making the velum, one can make it either in one or two pieces. To make it in one piece, a dummy should be first fitted up, in gutta-percha, or wax, consisting of a lower wing which should fit over the inferior surface of the soft palate, extending as far back as the bifuration of the uvula, and an upper and larger wing fitting on the superior surfaces or sides of the soft palate, extending back to within a quarter of an inch of the pharynx. The two wings must be connected at their anterior end where they are to be attached to the plate. Having done this the next thing is to produce in vela rubber. First then, make four plaster sections, like these that I am about to send round, and next cast them in type metal, after which the metal casts should be thoroughly washed, then pack in the rubber, not having the rubber or metal too hot. Previous to packing, paint the surface over with a solution of soap to prevent the rubber sticking. Then screw up in clamp and vulcanize two hours at 240°, two hours at 250°, and two at 260°.

Specimen 5.—Shows an obturator of the Suersen type for treating a case of congenital fissure similar to the previous case. It consists of a main plate and a hollow bulb fitting into the fissure and attached to the plate by means of a screw. With regard to making the bulb, it should first be fitted up in wax or gutta-percha, attached to main plate, and tried in the mouth, informing the patient to perform the action of deglutition several times, in order that the impression of the sides of the fissure may be left on the soft wax. Then trim up the wax, cutting away anything superfluous; also the posterior part of the bulb should not reach the pharynx to within one quarter of an inch to allow free passage of air through the nose. Next insert the dummy in the flask in the ordinary way. Previous to this cut patterns of sheet lead, to represent the size of the bulb, from which patterns are cut out in rubber. After washing out the wax from the flask, insert one piece of rubber in one part of the flask, and place in about two drops of water, then attach the other piece of rubber to the edges of the first piece by means of chloro-rubber; clamp up the flask and vulcanize. The two drops of water generate steam by means of which the bulb is rendered hollow.

Taking this as an example of the Suersen obturator, he says that separation of the cavity of the mouth from the cavity of the nose, is, under normal conditions, affected on the one hand by the velum palati, which strains itself (consequently by the Levator and Tensor palati), but on the other hand, also, by a muscle, which to his knowledge, had not yet received a sufficient amount of attention, viz.:—the superior constrictor muscle of the pharynx. This muscle contracts itself during the utterance of every letter pronounced with a nasal sound, and it was chiefly on the action of this muscle that he based his system of artificial plates.

Now, Kingsley quotes that in most cases of congenital fissures or defects, the patient will acquire correct articulation more easily with an elastic velum scientifically adjusted than with any other form of apparatus. That in cases of like defect the patient will never acquire distinct articulation with an obturator.

But when a patient with a congenital fissure of the palate, has overcome the difficulty by wearing an artificial velum until distinct and clear articulation has been acquired, then he may exchange the velum for an obturator, and continue to articulate properly. That of all obturators, he considers that of Suersen's is best adapted to the purpose.

When an obturator is adjusted, it will be some days before the patient can wear it with comfort ; also after a time the artificial palate can be worn shorter according to the progress of the patient in articulation and activity of the muscle. I might go on giving numerous examples of obturators, but the examples I have given and the general principles quoted, will be found to apply in most cases of deformities of the palate.

Before concluding, I would say this, that in all cases of congenital deformity, the patient must be taught the art of articulation, no matter how intellectual the patient may be, and how well the obturator or velum may be made, for it is upon the training of the patient to articulate properly, that success depends.

THE PRELIMINARY EXAMINATIONS.—" A Provincial Dentist" writes to the *British Medical Journal* pointing out that the standard of several of the preliminary Examinations that are accepted as sufficient by the General Medical Council, is lamentably low. In this way many who are mentally unfitted for a professional career are registered as medical students, and, by a process of "cramming," get through the necessary examinations at the least difficult places. They are then able to compete with really able men, and bring discredit upon the profession by the methods they adopt to secure patients. Of course some never get beyond the student stage, and, after an expenditure of time and money, have to commence some other walk in life. "A Provincial Dentist" thinks that a stringent entrance examination in Arts would be a good remedy for weeding out the dunces.

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At the last meeting of the Council a report was received from the Committee of the Regular Meetings of Fellows. The report was adopted, but it remains to be seen whether the Fellows who were so anxious to be able to meet together in the College, will be satisfied. The meetings are to be held twice a year, and are to be for consultative purposes only, and can have no official or corporate character or efficacy, The President shall determine what motions are in order. and direct the arrangement of the agenda, whilst the Chairman must be a member of the Council. The Secretary of the College or his representative will act in relation to the business of the meetings, and keep minutes of the proceedings.

SCHOOL CHILDREN'S TEETH.

40382

By R. Denison Pedley, F.R.C.S. Edin., L.D.S.

Table showing some of the results of an Examination of the mouths of 661 Boys at the Feltham Industrial Schools.

Age.	Number	Temporary Teeth requiring Extraction.	Permanent Teeth requiring		Temporary Teeth. Total.	Permanent Teeth. Total.	Unsound Teeth.	Teeth Extracted	Sound Dentures.
			Filling.	Extraction.					
10	11	21	15	10	21	25	46	1	2
11	55	63	34	27	63	61	124	1	15
12	108	84	111	78	84	189	273	18	17
13	163	96	180	159	96	339	435	59	23
14	174	70	204	180	70	384	454	53	41
15	127	24	170	160	24	330	354	58	23
16	20	6	25	21	6	46	52	14	2
17	1	..	..	..	..	..	..	1	..
18	2	..	2	4	..	6	6	..	..
	661	364	741	639	364	1380	1744	205	123

British Journal of Dental Science.

LONDON, FEBRUARY 1st, 1894.

MR. LEE RYMER ON THE DENTISTS' ACT.

Amongst the band of Dental Reformers, whose efforts culminated in the passing of the Dentists' Act, the name of Mr. S. Lee Rymer merits a place, and we can well imagine the interest with which such an one looks back upon the outcome of an exhibition of zeal, at one time exemplified by almost passionate energy, at another by the equally useful display of passive conciliation. They were indeed stirring times for our dental forefathers, and although, we believe, Mr. Rymer no longer practises his profession, he has found time amongst his many magisterial and municipal duties (he is now serving Croydon as Mayor) to contribute an interesting paper entitled "Notes on the Dentists' Act." The author is able to compare the state of our profession to-day with its condition some forty years ago, and observes unmistakable advances in every direction. This opinion, of course, does not altogether coincide with that of certain malcontents who would still prefer to find dentistry isolated, and, if controlled at all, under the management of a Board of Dentists. Whilst most of us think ourselves able to form an opinion as to the necessity or advisability of asking for a new or amended Dental Act, the opinion of such an observer as Mr. Rymer is, merits consideration. It is interesting to find that although he cautiously admits that the time will very likely come for such action, he does not think the present a fitting moment. It is suggested that until the Public become more enlightened, it would be useless to expect Parliament to do anything in the way of "protecting" the dental profession. During the period of waiting for such improvement, it is, however, wise that we make the best use of what we already have, and Mr. Rymer, on the whole, regards the Dentists' Act as having proved a great professional boon.

Another point, alluded to in the paper, is one upon which there has been a considerable amount of heart-burning in the past. In order to meet the exigencies of the moment at the passing of the Act, Section III provides that nothing therein contained shall apply to legally qualified medical practitioners, and although Mr. Rymer admits that under the circumstances this proviso was necessary, yet he is not altogether satisfied with the want of reciprocity which the present state of things maintains, and he seems to think this anomaly may require correction. For our part we scarcely think this likely. If the new Act (in which such a change should be provided for) is not to come until people are sufficiently educated in dental matters, then we imagine it will not be necessary to point out that the medical practitioner without a dental training is hardly a serious opponent. In fact we should be surprised to find that even at the present moment there are more than a very few medical men who care to take advantage of the proviso in Section III. With respect to the important matter of representation on the General Medical Council, it would not be difficult to find a good candidate combining the necessary medical and dental qualities. The wider question is with regard to the suffrage, and we should welcome the time when it might be found feasible to put all registered dentists on the electoral list and allow them to vote, as a part of the medical constituency, for the direct representatives on the Council.

DENTITION AS A CAUSE OF DEATH.—In a paper by Dr. Hugh R. Jones, of Liverpool, the following summary is given of the perils of infant life from a study of the morality statistics of the Registrar-General : "1.) The danger of contracting zymotic disease, with risk of life or of permanent injury—e.g., blindness from small-pox, kidney disease from scarlet fever, tuberculosis from measles. 2. The injury to health and the frequent death of infants who are badly fed—i.e., with improper food—or who are insufficiently fed. These dangers induce diarrhœa, digestive disorders, and the wasting diseases of infancy. Deaths from convulsions and dentition must be considered in this connexion. 3. The risk of diseases of the respiratory system, depending upon overcrowding and exposure to cold, and upon the debility due to privation, bad feeding or disease—e.g., rickets, specific fevers, &c. 4. Simple neglect—e.g., blindness from untreated ophthalmia of infants."

DENTAL ADVERTISING.—At a meeting of the Medico-Chirurgical Society of Nottingham, it was agreed, with one dissentient, that it should be considered unprofessional for medical men to give anæsthetics for unregistered or advertising dentists. We gather that a list of the local dentists is to be printed, and furnished to every registered medical practitioner in the neighbourhood. If this suggestion be carried out, will not the list cease to be one of non-advertising dentists; will it not constitute a new co-operative form of registered dentists advertising themselves to the local medicals?

THE PHOTOCHROMOSCOPE.—At the Annual Meeting of the Harveian Society there was a large display of the various methods of depicting disease. Photographs, lithographs, and wax models, covered the tables; and the walls were hung with water-colour drawings, many of them by the "old masters" of Surgery. In a side room members and visitors had an opportunity afforded them of inspecting the photochromoscope, the invention of Mr. F. E. Ives. The subject under the lens represented a dish of fruit in which all the natural colours were to be seen. This result is brought about by means of a special triple photograph which is called a Chromogram. This is a positive photograph on glass, with three images of the subject on its surface instead of one. By the use of selective colour-screens, the lights and shades of the three pictures represent the relative effect upon the three fundamental colour-sensations of the eye. In the photo-chromoscope the three images are superposed by a system of mirrors, and seen by the eye as if blended into one.

Antipyrin.—An inquiry as to the ill effects following the use of antipyrin has been carried out by the Therapeutic Committee of the British Medical Association. Although it seems that an impression is widely prevalent as to the occurrence of unpleasant symptoms following the administration of this drug, the present investigation goes to show that there are not sufficient grounds for such a belief. Seventy-three per cent. of the observers had never noticed any ill effects worth mentioning, and even when such have been recorded by the remaining twenty-seven per cent., they have been isolated instances out of many hundreds of cases. It also appears that in the large majority of these instances the doses employed have been injudiciously high or too long continued. A few examples are given in which the quantity administered was so small as to lead to the belief that the ill effects were due to idiosyncrasy, as is the case with almost every drug. The best precaution is to begin with small doses not exceeding ten grains.

Abstracts of British & Foreign Journals.

SOME CHANGES THAT TAKE PLACE IN AND AROUND THE PULP CANAL.

By D. E. Caush, L.D.S.I., Brighton.

During the microscopic examinations of exostosed human teeth, attention was continuously drawn to certain alterations in the shape and structure of the pulp-canals; it was an unusual thing to find in an exostosed tooth a perfect pulp-canal, and this led me to the examination of a large number of these teeth. The subject has been under observation about five years, and the deductions drawn are from the examination of between two and three thousand teeth. We were led to the furtherance of this study, on observing certain irregularities of outline in the pulp-canals of the teeth. In some cases we noticed here and there slight excavations at certain points of the canal, and from that stage we were enabled to obtain microscopic slides illustrating the various stages of the changes until the whole of the original outline of the pulp-canals had disappeared, leaving in its place a very irregular canal. The canal was also much enlarged, and it was observed that frequently in different directions the contour of the canal varied much, as the excavations may extend over a very small portion of the canal or they may continue in any given direction until a second canal is formed, frequently passing at right or acute angles to the original canal, continuing until it has passed through the dentine into the cemental tissue. These canals may be either simple or branched, or instead of canals passing thus at angles to the pulp-canal, the two or three canals of an inferior or superior molar may be united together into one large irregular canal. In all cases where this change has taken place the margins of the canals show a more or less irregular edge, produced by the semilunar excavations of the dentine. The definite termination of the dentine, as seen in the pulp-canal of an ordinary tooth, has given place to the indefinite, and irregular margins are produced. These semilunar excavations vary much in size, as well as in number, varying from a single slight dip or depression as found in the earlier stage to the numerous excavations producing the complex and irregular outline as seen in the advanced stage. If, as is often the case, these teeth remain in position after these excavations have been produced, a second change more marked even than that of the excavation oftentimes follows, for in these depressions it is not at all unusual to have a deposition of new bony tissue, entirely different in microscropic structure from the dentine which surrounds it. In this new tissue we have no tubuli radiating to a given centre as in the ordinary dentine, but in place of the tubuli we have a number of lucunæ and canaliculi, in character somewhat like those found in true cemental tissue. This tissue does not appear to be true bone, as it is very unusual to find any true Haversian system, even where there is comparatively a large amount of the new tissue deposited. The lacunæ as seen in this tissue are irregularly placed, as in the thickened cemental tissue, and vary much in number and position. They may be very closely packed, with short canaliculi, or they may be scattered throughout the substance of the tissue, and have canaliculi of some length joining two or more of the lacunæ together.

As to how these changes are brought about is a subject of great interest. The irregular margin and semilunar character of the edges give us a clue, and show at once that there must have been absorption going on in a greater or lesser degree, according to the amount of change that has taken place. This absorption may have commenced at different points of foci along the margin, and gone on spreading till the whole of the margin is acted upon, or it may commence all along the edge of the canal at the same time. It is evident (microscopically) that such an edge could not be produced by the addition of new tissue alone, as in cases where secondary dentine is deposited either as dentine of repair (in those cases where caries has almost penetrated to the pulp-canal, or as a result of repair following accidental penetration of the pulp-canal during the operation of preparing a cavity for filling), or as a result of pulp-calcification, for in either of the enumerated cases the microscopic structure of the tissue is quite different ; in all these cases the new tissue is always added *directly* to the older tissue without any excavations or absorptions of the original margin, and the secondary dentine is deposited directly from the odontoblastic layer of the pulp. It would appear then that these excavations, and this new tissue, cemental in character, could not be produced directly from the odontoblastic layer of the pulp in health, for we have seen under such circumstances, should there be any deposit, it would take the form of secondary dentine or pulp calcification.

The first change we have to consider is that which takes place in the layer of odontoblasts, or lining cells of the pulp-canal. These cells are the points of attachment to, and the source of nourishment from the pulp to the dentine, the connecting link between the hard calcified dentine and the soft vascular tissue and nerve-matter that forms the pulp ; it is from this layer that the secondary dentine is formed, but under certain circumstances the character of the cells forming this layer changes, both in shape and size. Thus if by such cause as congestion, or slight inflammation of the pulp, a greater amount of blood is brought to the blood-vessels in the pulp, these cells appear to lose their original shape, and (instead of being elongated with processes penetrating into or passing between the tubuli) swell up, the nuclei becoming active, and new cells are rapidly formed by cell-division. As these new cells continue to form, a layer like the alveolar dental membrane in appearance is produced, and this newly formed layer presses upon the dentine. The cells in juxtaposition with the dentine begin to absorb the latter, and thus obtain more room for further development. This goes on as long as there is an abnormal blood-supply to the pulp, and thus owing to either a long or short time of pressure upon the dentine, caused by the excess of formative material brought to the cells by the increased blood-supply, we may have many or few excavations produced, as in the case of chronic inflammation of the pulp we get many excavations, and oftentimes these excavations penetrate more deeply into the original tissue. Or should there be any imperfectly calcified tissue surrounding the pulp-canal, at that point the giant-cells will penetrate more easily and the excavations will increase in that direction, and in some cases produce canals that pass out of the pulp-canal at various angles. These excavations may grow continuously, or there may be times of quiescence as well as times of activity, while these terms of activity or rest may correspond with similar changes on the external surface of the tooth and produce layers of cemental tissue. Should the tooth be extracted about this period, nothing but the excavations or the thickened membrane will appear in the pulp-canal.

These changes, as we have seen, are produced by the changes that have taken place in the odontoblastic layer of the pulp-canal. If the tooth is not extracted, the whole of the pulp becomes more or less congested and altered in character ; the odontoblastic layer being destroyed, there is little or no inter-communication with the dentine by the tubili, and at this stage one of two things may occur :

1. The blood-supply becomes normal, the congestion temporarily passes away, and for a short time the tooth is tender to the touch as if there had been periostitis, and from this stage it gradually becomes comfortable, and remains so until the inflammation again commences, or—

2. The giant-cells change their character, and become formative cells producing as a result of calcification a fresh tissue in the canal containing a number of lacunæ with their canalculi. In this tissue thus we have a new tissue formed in the enlarged pulp, in character and in microscopic structure resembling cementum, developed also from a membrane similar in character to the alveolo-dental membrane ; and on considering the close relationship during development of the two tissues (dentine and cementum), it does not appear to be at all difficult to follow the various stages that take place in the production of this new tissue. These changes are not confined to the human subject. I have found the various stages in the incisors of the horse, though the molars are all free from any of the various changes. I have also found the incisors of the horse exostosed, as well as the enlargement of the pulp-canal and the new tissue deposited in the excavations.

The Dental Cosmos.

NORMAL DEVELOPMENT OF THE ROOF OF THE VAULT.

By Eugene S. Talbot, M.D., D.D.S. Chicago.

If we examine the mouth of a child at the fourth or fifth year, we find a well-developed jaw. The curves are all graceful in outline, and the contour of the dental arch is well formed. This could hardly be otherwise, for the reason that the jaw is growing rapidly for the purpose of accommodating the permanent teeth, and the circle of the alveolar process is larger than that of the teeth. Spaces exist between the teeth, and therefore crowding cannot take place.

We could not expect to find two vaults alike in height, width, or contour, although each is normal in itself. In the development of the jaws we have two structures, the hard dense bone of the maxilla and hard palate, and the soft, spongy bone, the alveolar process. The maxillary bones develop and unite at the median line. The contour of the top of the vault is now established. It is held in position, on the sides, by the walls of the antrum, supported by the malar process and by the anterior alveolar process and maxillary bone. In this manner the vault is held in its natural position. The maxillary bones, like all the other bones of the head, develop in every direction in a general way, until the growth is established. Between the ages of four, when all the temporary teeth are in place, and twelve and fourteen years, when all the permanent teeth are in position, great changes take place in the shape of the jaw.

In young life, the lower jaw presents an obtuse angle; this gradually changes until at middle life it assumes a right angle. In order that the alveolar process and teeth may compensate for this change as the second set comes into position, the alveolar process lengthens with the eruption of the teeth. This is proved by the location of the mental foramen, which is situated at the superior border of the lower jaw early in life, and at middle life just midway between the upper and lower borders of the bone. The same changes take place in the upper jaw. This is quite noticeable on the sides of the alveolar process at the roots of the first permanent molar, soon after it has erupted. Upon examination we shall observe what seems to be a depression, but by careful examination we find that it is a lengthening of the alveolar process. When the crowns of the bicuspids are ready to advance, and absorption of the roots of the temporary molars takes place, there is some irritation in the alveolar process. The first permanent molar coming into position advances farther than the line of articulation of the temporary molars, and the pressure of the jaws rests upon the first permanent molars. This fact, together with the irritation already mentioned, has a tendency to lengthen the alveolar process, so that when the bicuspids come into place there is a difference in the height of the vault. There are plenty of illustrations to show this development of the alveolar process, and every practitioner of dentistry has observed it. One of the most common illustrations is that when the molars upon the lower jaw have been extracted, the molars upon the upper jaw (for want of antagonists) drop down by the lengthening of the alveolar process. In those cases where the vault is very high, the alveolar process is always very long and thin. The depth of vault is also governed by the angle of the jaw. Thus, if from inherited constitutional disease, such as consumption, syphilis, etc., arrest of development of the maxillæ should ensue, the angle would not change from an obtuse to a right angle. It will be noticed that when the mouth is opened the anterior part has to travel a greater distance than the posterior part, hence either the anterior inferior alveolar process will elongate, so that the lower incisor will articulate with the upper, or the anterior superior alveolar process will elongate to meet the lower incisor and bicuspid. Occasionally this will take place in both jaws. In either case the superior alveolar process becomes long and thin, and the vault is quite high. In cases of arrest of development of the bones of the nose, and adenoid growths, when it is impossible for the child to breathe through the nose, and mouth-breathing is a necessity, the jaws are separated, and the teeth not having a resting-place, the alveolar process elongates, and a high vault is almost always noticed; hence the reason why imbeciles and all degenerates who keep the mouth open, as a rule, have high vaults.

On the other hand, we occasionally notice the jaws brought closely together. This is due (1) to a short ramus; (2) to right angles of the rami to the body of jaw; (3) to arrest of development of the alveolar process, and (4) to teeth with short crowns, or teeth not fully erupted. In such cases the vault is low, the alveolar process thick, and usually the lower jaw is quite broad. The lips pout; the face is short and broad. Frequently the upper jaw is arrested in its development; the muscles of mastication are very set and rigid.

The height of the vault, then, is not due to the roof's being pushed or pulled up by a pressure exerted through the vomer, by the development of the sphenoid bone, nor does the shape of the base of the skull in any way affect it. The height is due entirely to a growth downward of the alveolar process and teeth. The extent of the development of the alveolar process depends upon nature's becoming satisfied with her architectural figures, and harmonizing the jaws, alveolar process, and length of teeth. That the distance in height is changed from a child to a person in middle life is demonstrated by the following figures. Thus in three hundred and seventeen children, under five years of age, before the development of the first permanent molar and alveolar process, the lowest vault measured .17, the highest .62, with an average of .42. If, now, we notice the height of vaults in children at different ages, we find, with two exceptions, a gradual advance in the height of the vaults until in four thousand six hundred and fourteen adults' vaults we have lowest .21, highest .84, with an average of .58. It will, therefore, be observed that the height of vault develops about .33 to .25 in depth after the permanent teeth commence to erupt. In nine hundred and eight measurements of the vaults of ancient and modern Romans, Peruvians, Sandwich Islanders, Mound Builders, American Indians, Negroes, etc., the minimum height of vault was .25, while the maximum height was .88, average .53. By comparing these figures with those of modern individuals, the lowest vault is a little higher (.04) than in modern, and the highest a little higher (.04). The average, however, is a little lower than in the modern vaults of .05, thus showing that the ancient and pure races of individuals possess more uniform and lower vaults than modern. We would conclude, therefore, that the height of the vault depends upon the length of the face from the chin to the top of the head. So far as the height of the vault is concerned, no race, type, sect, or intellect can lay claim to high, medium, or low vaults. They permeate through all classes of individuals.

Dental Cosmos.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary monthly meeting, December 4th, 1893. Mr. W Bowman Macleod, L.D.S., President, in the chair.

The PRESIDENT said he regretted that at the last meeting there was an omission to report to the Society the loss by death of two members. Mr. W. R. Wood, L.D.S., of Brighton, had been a member of the Council in 1879 and 1880. He was elected a member in 1863, so that his connection with the Society had lasted for thirty years. The other name was that of Mr. J. E. Rose, of Liverpool, who was a member of the Council in 1875, and a Vice-president in 1880, 1881 and 1882. It was a curious coincidence that both these gentlemen were elected in the same year, and both died in the same year. It was decided to send letters of condolence to the relatives of both members.

The President said that Obligation Forms, duly signed, had been received from Mr. Edward Blain, Bridge House, Taunton, and Mr. Chas. F. Sutcliffe, Victoria Terrace, South Shields, and announced their admission as Non-Resident Members.

Messrs. CLAYTON WOODHOUSE and GEORGE HERN were appointed auditors for the year.

The CURATOR stated that he had received from Mr. Morton Smale two donations for the museum. The first was a very good specimen of a class of work much in vogue in times gone past, and which was becoming rarer every day, viz., an entire lower plate carved in bone, with natural teeth inserted for the front. The second donation was a number of fossil teeth from an unnamed variety of hippopotamus. At the present time the authorities of the British Museum were engaged in endeavouring to name suitably the variety, and when their decision was arrived at it would be communicated to the Society.

Mr. TREWBY, a student of the Dental Hospital, had presented a model showing gemmation of the two lower centrals with the laterals. The model was taken from a boy aged 5 years, and Mr. Percy Smith—under whose care the boy was—had promised to watch the case, to see whether the permanent teeth were similarly affected.

On his own behalf, Mr. Storer Bennett presented the model showing a conical peg-shaped supernumerary tooth growing between two upper temporary central incisors in a boy aged six years.

Mr. W. HERN brought forward a case of circumscribed necrosis of the mandible on the left side, involving the mental foramen. It was the case of a youth aged 19, a recruit, who came to the Dental Hospital, and was seen first of all by Mr. Robbins. When he (Mr. Hern) saw the case, the man had the ordinary symptoms of necrosis. There was a swelling on the left side of the jaw, with a considerable amount of pus oozing up, and on taking hold of the necrosed bone with the forceps it came away easily with a sort of snap. Unfortunately, he did not test the parts to see whether there was any anæsthetic condition of the nerve, but immediately after taking out the necrotic piece he found that the patient had anæsthesia over the area supplied by the mental branch of the inferior dental nerve. The history was that the man had a blow with a stick. Judging from the state of his mouth and the absence of any external mark, it could hardly be said that the necrosis was the result of violence. The teeth were all normal, with the exception of the lower second bicuspid on that side. He gave a history of having had the attempt made to extract that tooth some time previously. The necrosis appeared to have been due to suppurative periostitis around the root of the second bicuspid, and the specimen showed the close contiguity of the root to the mental foramen.

Mr. ROBBINS said he distinctly remembered this patient. He was called to see him, but found him in a drowsy condition, and unable to give a history of his case. On being taken into the extracting room a bicuspid root was found very deep down. He failed at the first attempt, but at the second the root was extracted. It was necrosed all the way through. A mouth wash was ordered, and the man was told to present himself at the hospital in a week's time. However, he saw no more of him, and the next he heard about the case was from Mr. Hern.

Mr. HENRI WEISS described an angle mallet which had been constructed from an original pattern conceived by himself. He pointed out the existing difficulties which had hitherto been experienced from the want of a reliable mallet for attachment to the dental engine, which would condense cohesive gold in any position, other than the straight, with a varying force under easy control. The action consisted in the recovery of a flat spring raised by a revolving heart-shape disc—a movement he regarded as the acme of simplicity. "This is obtained by a *rod* with an articulating end in a suitable metal boxing and sheath for attachment to the hand-piece of the engine, and being fixed to a heart-shape disc revolves so as to allow the apex to appear above the boxing at each revolution. Above this is fixed, by means of a screw, a flat steel spring, at the anterior part of which is extended a strong steel projection bent at a double obtuse angle, the plugger. It will be seen that by the adaptation of these parts whenever the disc revolves, the spring and extension rise, to fall by a sudden movement upon the disappearance of the apex of the disc, and thus is obtained a distinct blow at each revolution. This part of the apparatus is wholly outside the mouth, enabling the operator to see his work without being obscured. To prevent the action being interfered with, at least with plugger No. I, an *arm* is carried forward and lies immediately beneath the plugger following its angles, and not only serves the prime purpose, but prevents the freshly laid piece of foil from being moved, as it is held by the arm. We therefore have only to place the piece of foil in the cavity, when it is held by the extension arm, and the plugger delivers a series of blows until it is secured to the previous layer. The strength of the blow is regulated by a slide plate with a finger table, which passes along a slot above the spring, so that the spring being tempered to deliver the blow zero, the slide plate may be pressed forward until the blow becomes so strong as to nearly stop the revolution of the engine.

"Plugger No. 2, *the Over-reach*, is similar to No. 1, with the difference that its point is longer to allow of it reaching into a deeper cavity, and when the cavity may be too small to admit both it and the arm, but with this one in use the arm must not be pressed against the gold, or the plugger will be raised so high as to escape the action of the revolving disc. Plugger No. 3 has a large convex point to condense non-cohesive foil.

"The advantages claimed by this mallet are, first, the action is the same whichever way the engine revolves; secondly, the plug is obscured by two points, equal only in extent to the points of a pair of dressing forceps; thirdly, the strength of the blow is regulated by a simple movement of the index finger; and lastly, the work is never obscured from view." Messrs. Ash & Sons have undertaken to reproduce the mallet.

Another useful contrivance was also shown by Mr. Henri Weiss in the original model of a chip blower for the dental engine constructed by himself. The great delay in the preparation of dry cavities by the accumulation of *debris* led Mr. Weiss to put together this simple means of disposing of the same, and was briefly described. Beneath the treadle of the engine is fixed a valve india-rubber ball, from which passes a tube, following the standard and arm to the hand-piece, the latter part being provided with a two-way stopcock which directs the current of air from the ball beneath the treadle to within half an inch of the cutting bur. The tap of the stopcock enables the current of air to be diverted to the side when not required for the cavity, preventing any accumulation of air when not in use. The engine hand-piece is in no way rendered clumsy by this addition, for although the calibre of the tube is large to prevent a needle-like blast, it lies conveniently along the side. Mr. Weiss explained that he had tried various means to heat the air, but owing to the rapid radiation of the heat along the tube, in spite of a large spirit lamp heating a metal ball and spiral, no perceptible increase of temperature was obtained. Another feature which led Mr. Weiss to discourage the use of heated air was that the patient did not complain of pain from the current of air; in fact, he proved slight obtunding properties in its use. He always commenced the preparation of the cavity without the air current, and turned it on when the *debris* commenced to accumulate. The ease with which the defective tissues could be watched, and the cutting of grooves facilitated, placed this little machine among one of the most useful additions to our already well supplied wants. Where the electric motor was used the ball could be placed on the floor, and from time to time pressed by the foot. He understood Messrs. Ash & Sons would construct replicas in a convenient form for use with their handpieces and engine.

Mr. Ashley Barrett exhibited a contrivance for carrying a loop of wire for measuring the circumference of roots for crowning. He said it was a home-made device, very inexpensive, and answered fairly well. A similar contrivance had been described in some of the American journals, though apparently not quite on the lines of the one exhibited. The wire loop was passed over the tooth and rotated; the loop was then cut and lifted off carefully.

Dr. J. W. Pickering then read a paper on "The Physiology of the Heart in relation to Anæsthetics," which we publish at page 97.

Discussion.

Mr. Robbins said it might seem strange that he, not being a scientific man, should take the first place in that discussion. It might seem a little mad, but there was a method in the madness. The title of the paper appeared to one or two of their members to be a little outside the ordinary line, and it had been questioned whether it would not have been better to have read it before a society of anæsthetists. He, however, thought differently, and would explain his reason. It did not always follow that when dentists had finished their curriculum in the hospital, and, having gone to the College of Surgeons, had passed its portals and been blessed with that piece of paper with those wonderful autographs upon it, that they were privileged at once to be able to start in practice in Grosvenor Square or Harley Street, and on behalf of suburban and provincial members of the Society he wanted, if possible, to bend the discussion into a practical channel. The average qualified dental surgeon was not so happily placed as gentlemen practising in the fashionable districts, who had the advantage of being in close touch with those eminent men who had made it their special study to administer anæsthetics, and he knew of no better condition for operating than to feel that they had a first-class man on one side of the chair, whilst the dentist was operating on the other. Taking the average practitioner, he was often called upon by the British public, whether rightly or wrongly, to administer nitrous oxide, either helped by the local general practitioner (and they all knew what that meant), or by a qualified assistant, or, perhaps a partner. Speaking on behalf of the main bulk of those gentlemen, he might say that they knew, as a rule, with ordinary cases and with the great majority of cases, what to do and what not to do. Speaking from an experience acquired during some fifteen years, he could count on the fingers of one hand the cases that had given him any anxiety in the matter of gas administration. But a case might occur where it was not simply a question of starting respiration again, or of pulling the tongue forward, or of pinching globules of nitrite of amyl; there might be a case where the heart seemed about to stop, and that was the point he was coming to. Dr. Pickering had given some considerable time to his subject, and had thrown out one or two very practical hints. Seeing that there were gentlemen present of great experience in this matter, he was bold enough to ask them, speaking for the suburban and provincial men, to lay down some easy rules that might be adopted should their patients be *in extremis*, so that instead of losing their heads and frightening themselves and the patient's friends, they would know exactly what to do. Dr. Pickering had said that he found the application of heat to the region of the heart very useful. With the dentist hot water was always present; it was very easy to get and to apply, and if it did not do any good it could not do much harm. The injection of strychnine he must leave to be discussed by others, but he really had good hope tha although this was a very abstruse and scientific paper, they might be able to cull some good out of it in a practical form.

Dr. Dudley Buxton said he had seldom listened to a more able or scientific paper than that brought forward by Mr. Pickering. It was a paper for which no excuse was needed. They had been told that the point of view to which they should address their remarks should be practical, and in order to carry out that suggestion he would confine his observations to the anæsthetics in use amongst dental surgeons, and not deal with the very wide range of subjects which had been touched upon by the speaker. Perhaps one of the most important points of the paper was the introduction of a method of investigation of the physiology of anæsthesia, probably new to many members of the Society.

He referred to the employment of the heart in the embryo, by which means one of the factors was eliminated in the great problem of how anæsthetics might kill. It was a matter of considerable interest to find that Dr. Pickering had found from a comparison of recent authorities, and from his own work, that his results corroborated those at which he (Dr. Dudley Buxton) had arrived from a research which he had undertaken some years ago, and which he had had the honour of bringing before the Society, viz., in a series of papers entitled "On the Physiological Action of Nitrous Oxide Gas." It had always been a great help to him, in dealing with patients, to be able to assure them that the action of nitrous oxide was that of a heart stimulant rather than that of a cardiac depressant.

On that point the paper certainly bore very strongly. They were told that the mixtures of nitrous oxide and oxygen were possibly not so anæsthetic as nitrous oxide pure and simple, and they should bear in mind, when experimenting, what they had heard of the effect on the embryonic heart of the prolonged use of nitrous oxide. The consideration of the experiments referred to would explain many of the failures which were met with. Professor Wood, in a somewhat recent pronouncement, came to the conclusion that nitrous oxide acted purely as an asphyxiant ; but, like so many other observers, he overlooked the fact that if nitrous oxide was pushed beyond a certain point, they not only had the physiological action of the pure gas, but it was complicated by asphyxial effects, or by a deprivation of oxygen, producing those familar spasms and convulsions which always occurred when an animal was deprived of its due supply of oxygen. It might be shown that nitrous oxide, pure and simple, did not produce any effect save its own specific effect, and when so used it was devoid of danger. It was probably that fact which had endeared it so much to the heart of the dentist. Passing on to the question of carbonic dioxide associated with nitrous oxide, such a combination must always be most deleterious, and any method which lent itself to the production of an excess of carbonic dioxide had a deficiency of oxygen which must be most prejudicial. It was not possible in this discussion to go fully into these matters, and therefore he would pass to the consideration of chloroform and ether, though he was bound to confess that many regarded those agents as, perhaps, rather outside the usual routine of the work of that Society. In speaking of chloroform the lecturer had not spoken of the very recent work of Professor Hare and Dr. Thornton. With reference to the work done by Dr. Wood those observers had come to quite different conclusions than those at which Professor Wood had arrived. They were aware that Professor Wood was inclined to regard chloroform as a heart depressant, and not as an asphyxiant pure and simple; that was to say, he believed in primary cardiac syncope being a common kind of death under chloroform, whereas Professor Hare and Dr. Thornton had come to the other conclusion. They believed that chloroform, if injected into the veins, would produce failure of the heart, and if inhaled, would produce failure of respiration. He need hardly remind the Society that that conclusion was diametrically opposed to his (Dr. Buxton's) own work, and the work of many men far more able than himself. From recent work upon the lower animals, his opinion had been more than ever confirmed that the principal action of chloroform —as far as they were concerned—was its action upon the heart and vaso-motor system, which, telling back upon the heart, induced that terrible syncope against which there was apparently, no safeguard, and with which there was no competent means of dealing. It had been suggested that various methods might be of use in the attempt to restore chloroform-injured heart. Professor Wood favoured the injection of strychnine, which was unquestionably of great value—probably of greater value in the lower animals than in man—because the time that elapsed between the occurrence of syncope and the attempt at restoration in man was usually too long to allow of any sufficient absorption of the strychnine, and any action which might be thereby induced was not set up before the patient was absolutely dead. One practice which he himself should regard as being, perhaps, more valuable, was that of forced respiration, by which air was pumped into the lungs, and so the chloroform was got rid of. With regard to the action of heat, it was interesting to find that in embryo hearts heat had such a powerful restorative action.

In tabulating the very large number of cases which formed the *Lancet* "Chloroform Report," he had found that heat had been applied in some cases, hot water being poured from a great height over the præcordium, in some instances with success, but in many cases with failure. Another method which had been adopted, and it was one of which he had practical experience, namely, that of the mechanical manipulation of the heart, when it showed signs of stopping. It had been suggested, and records had been published in some of the journals, that when heart failure appeared the heart should be grasped, as it could be in most persons who were not over stout, and should be mechanically manipulated. In some cases that method, which seemed perhaps rather rough, had been very successful, even after so long a use as three-quarters of an hour. The question of dealing with ether scarcely called for any prolonged remarks. It had been shown by the lecturer that ether was a powerful stimulant, and they knew that it acted in the same way upon the human being, and was, in most cases, absolutely safe. Without going further into the question he would content himself with congratulating Dr. Pickering and the Society on the very able paper which he had brought forward.

Dr. Silk said he felt somewhat in the position of being between the devil and the deep sea. He did not mean to say that Dr. Pickering was the former or that Mr. Robbins was the latter ; but the difficulty was this : if he were to try to be scientific he was afraid that Mr. Robbins would object, and if he were to try to be practical perhaps Dr. Pickering might object, and say that his paper ought not to have been discussed from a merely practical point of view. It was, therefore, a very difficult matter to deal with a paper of that kind before a number of gentlemen who were so pre-eminently practical. Looking at the matter from a broad point of view, it seemed to him that the paper confirmed, in a very able and unique manner, the observations of so many previous workers, such as Gaskell and those mentioned by the author and by Dr. Buxton. One point upon which he was not very clear was with regard to the use of oxygen with nitrous oxide. Dr. Hewitt, a great authority upon that subject, was present, and would no doubt like to know exactly what was the point of view taken by Dr. Pickering with regard to that. He was afraid that, being a little obtuse, he did not quite gather whether it was meant that the use of oxygen was of less importance than getting rid of the nitrous oxide. Certainly, what he had always taught with regard to nitrous oxide had been that it was not so much a question of asphyxia as it was of oxygen starvation. Oxygen starvation was the condition which gave rise to troubles in the way of jactitation, which was really the bane of the dentist. For that reason he believed, on the same principle, that Dr. Hewitt had introduced a very beautiful method of giving oxygen. The objection to that had always been that the process was an extremely delicate one requiring the skill and ability of Dr. Hewitt to do it properly; so that if it were possible that a similarly good result could follow the administration of small quantities of air, they would, he thought, get a very satisfactory condition of affairs. He had been dabbling a little in this sort of process himself, administering small and known quantities of air, and although he did not get such good results as with nitrous oxide alone, at any rate there was a good deal of prolongation of the anæsthesia; and just in the same way as with oxygen there was, in a greater proportion of cases than with nitrous oxide, a good deal of tendency to hysteria and disturbances of that description. Another practical point following the observations made by Dr. Buxton, was the question of asphyxia in any way, by which he rather fancied that Dr. Buxton meant anything like the use of what was known as the supplemental bag. The supplemental bag was almost a thing of the past, and rightly so, but he was not at all sure that its abolition had not been rather illogical. If, as he took it to be the case, in the administration of nitrous oxide the tissue metabolism was quite at a standstill, there should be comparatively little carbonic acid produced, so that logically there could not be any objection to the use of the supplemental bag at the end of the inhalation. If they could depend upon the carbonic acid alone being a deleterious product (which he did not think was the case) then it was right that the supplemental bag should be abolished. He was very pleased to hear that Dr. Pickering, from the high pinnacle of physiological study, should have confirmed the view which so many had held with regard to the use of alcohol: that was, that it was to all intents and purposes bad. They certainly should be very much disposed to accept that dictum. It had this practical bearing, that so many patients came to the dentist and said, could not they have a glass of brandy, or something of the sort? That was very wrong, not from a high moral point of view, but because from the point of view of the administration of nitrous oxide they were very liable to get subsequent depression. Then, as to means of resuscitation, the question of strychnine had been raised on the suggestion, mainly, of Professor Wood, of Philadelphia. Certainly as far as he (Dr. Silk) had tried it, he had been very pleased with the result, and one need not wait always until the condition was such as to be highly dangerous before it was administered. It was an advantage in prolonged cases of anæsthesia which were to last for an hour or two; or in which a large quantity of blood was likely to be lost, that at a very early stage, if not before the administration, there should be an injection of something like 1-50th of a grain, or more, of strychnine hypodermically. In cases in which he had done this, he had been very pleased with the result. Then again, as to the practical point of heat, the heat of the physiological laboratory was very different *quasi* the heart from the heat produced by pouring hot water on to the præcordium. He spoke with all deference, but he had some difficulty in thinking that heat applied to the præcordial region in that way ever reached the heart at all. He should rather be inclined to say that the action of heat under these circumstances was reflex, due to the stimulation of the nerve extremities rather than to the actual heat bath applied to the heart. These were all the practical points which occurred to him. He might speak on the more strictly scientific question, but he was afraid that would be wasting time quite unnecessarily.

Dr. Hewitt said they owed a considerable debt of gratitude to Dr. Pickering for his extremely able paper. One felt also that there was hardly time to discuss it as it should be discussed from the purely scientific side. He therefore asked to be allowed to make a few practical remarks, more especially in connection with nitrous oxide, as that was of greater interest for those present than any other anæsthesic.

Dr. Pickering's observations had been of particular interest to him in connection with what had been said about oxygen and nitrous oxide. He understood that Dr. Pickering used about 30 per cent. of oxygen with nitrous oxide ; and though he did not distinctly state it, he threw out the suggestion that the increased formation of carbonic acid gas might be a source of danger. It was quite obvious that with this large percentage of oxygen, carbonic acid would be produced in larger quantities than with the percentage of oxygen that he (Dr. Hewitt) should venture to advise, and which he continued to employ. It was also obvious that with that large percentage of oxygen, respiratory movement would be feebler, a condition of physiological apnœa would be arrived at, and the interchange between the gases and the air would necessarily be far slower than if smaller quantities—say from 5 or 10 to 15 per cent. of oxygen were used. When 5, 10, or 15 per cent. of oxygen was used with nitrous oxide, respiration was performed in very much the normal manner, and so far from there being any chance of accumulation of carbonic acid in the blood or the lungs, ventilation had taken place freely throughout the whole of the administration. One could hardly understand that there could be any sort of danger from such a condition as Dr. Pickering suggested. He believed the time would come when nitrous oxide would be administered with oxygen on all occasions, and the more that he saw of this method the more he regarded the use of nitrous oxide free from oxygen as a clumsy, old-fashioned and utterly unscientific method. Although Dr Dudley Buxton did not at present agree with the administration of oxygen with nitrous oxide, for reasons which he (Dr. Hewitt) could hardly understand, he thought the time would come when he too, on scientific principles, must adopt this method of procedure. Also with regard to the safety of their patients, he believed that the use of oxygen with nitrous oxide was strictly indicated. Before he administered oxygen with the nitrous oxide he had occasionally cases in which it was necessary to pull forward the tongue, and in persons with very rigid chests he had on one or two occasions to compress the chest. There was also one case with which, perhaps, members were familiar—where he had to perform trachetomy after the administration of nitrous oxide. Now that he gave oxygen with nitrous oxide he had never had the slightest occasion to pay more attention to the patient than if he had been administering air. There had never been the slightest necessity to adopt any remedial measures, and he believed that with the percentage of oxygen which he employed with nitrous oxide there was absolutely no risk. He mentioned this because he had carefully studied the cases, and he believed that no one could bring forward an instance to the contrary. A dog had been kept for seventy-two hours breathing a mixture of nitrous oxide with 10 per cent. of oxygen, and although he did not wag his tail as he was in the habit of doing when he came out of the chamber, at the same time he appeared none the worse for his confinement, and his respiration continued. Looking at Mr. Pickering's valuable paper broadly, he wished to point out a practical fact which was of considerable importance, namely, that the best stimulus to the heart's action was to keep up the respiration. The teaching of the Hyderabad Commission was that when an overdose of an anæsthetic was given it was the respiration which was to a great extent primarily embarassed. If they could stimulate the respiration, and also the circulation by keeping the respiration perfectly free and supplying plenty of oxygen, whether with nitrous oxide, ether, or chloroform, the circulation would be kept perfectly good. In one or two cases in the hospital he had seen patients in a condition of syncope from pain or other causes. In such cases they had given nitrous oxide with oxygen, and the colour was seen to return and the circulation to improve. Only during the last week Dr. George Oliver brought to the Dental Hospital an ingenious instrument for observing the pulse, and it was found that whereas with nitrous oxide alone the calibre of the pulse diminished and the pulse became smaller, when oxygen was given, in every one of those cases the calibre of the pulse remained full and good, and much better in tone than when the nitrous oxide was given without oxygen. He mentioned these facts because they bore indirectly upon the paper. Dr. Silk mentioned the supplemental bag. Very little need be said about that in connection with the paper. There was one point which occurred to him in connection with the use of oxygen. A great many people believed that when oxygen and nitrous oxide were used, a rather imperfect and insufficient form of anæsthesia was obtained. Reading the results obtained by German observers, who had adopted this method for a length of time, he found it stated that a deeper form of anæsthesia was possible when oxygen was used with nitrous oxide. At first he could hardly accept that statement, but he had at last come round to that way of thinking. The fact was that the oxygen acted as a vehicle to introduce a considerable quantity of nitrous oxide through the circulation, and in that way they got a more profound anæsthesia and longer unconsciousness. It was necessary to point this out, because it might be imagined that the use of nitrous oxide induced a rather insufficient and imperfect form of anæsthesia. He regretted that time did not permit of a longer discussion of this valuable paper.

Dr. Pickering, in reply, said the subject had been dealt with from the practical side by gentlemen well able to deal with it, but there were one or two points he would like to refer to. As to the question raised by Dr. Hewitt, it would be interesting if it could be determined experimentally at what point the percentage of oxygen administered with nitrous oxide would increase the amount of carbonic acid in the blood. By experimenting with Oliver and Garrett's apparatus, it might be found at what point the conjoint administration of oxygen and nitrous oxide would increase the intravascular gas-tension. He believed that oxygen increased the tension of the blood, but it was possible with small quantities, such as Dr. Hewitt had been using, that it might not do so—that the small dozes of oxygen might have no stimulant effect on the metabolism. That was, however, a question to be experimentally determined. With regard to the action of strychnine on the heart, he was glad to know from a clinical point of view that the experience of specialists confirmed his results. The question of heat was also worthy of notice. It was quite possible that heat over the præcordium might act reflexly, and they might get a cardiac stimulus in this way; but would it be possible to get the physiological application of heat to the heart? If it could be physiologically introduced into the clinical work it might be of some value. He was sorry that no speaker had touched on the question of electrical stimulation, because that was a matter creating a great deal of interest in the physiological world. It seemed, however, to have escaped notice. Possibly some written communications which might come in afterwards would deal with this question. He begged to thank the Society for the kind manner in which they had received his paper.

The President tendered the thanks of the Society to Dr. Pickering, the reader of the paper, and to those who had brought forward Casual Communications.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The postponed meeting of this Society was held on Dec. 15th, Mr. W. Rushton, President, in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. **Arnold Prager** described a new local anæsthetic called coryl, very similar in properties to chloride of ethyl. The advantages claimed were a very quick and complete local anæsthesia, no waste, and that the bottle could be refilled as required. The disadvantages seemed to be the expense of the apparatus and its somewhat formidable appearance.

The **President** brought forward the following case:—An English lady residing in India, had complained to her medical man that the preparation of iron which she was taking, was discolouring her teeth. He supplied her with a liquid which was to be brushed on the teeth frequently. The lady only used it once, as she said it was "so strong." On analysis, it was discovered that the liquid was composed of one part of acid. hydrochlor. fort., and four parts of water, being sufficiently strong to have dissolved the enamel very quickly, if its use had not been discontinued. The practical points bearing upon the case were these:—Patients should never be supplied with any acid preparation whatever as a tooth cleanser. If iron, or acids in any form (tonic medicines generally contain acid) are being taken, the patient should be advised to use a mouth-wash of water, rendered alkaline with a pinch of bicarbonate of potash or soda, after each dose. The medicine tube is a further (though insufficient) safeguard.

Mr. **Messenger** mentioned a case which had come under his notice, in which a lady has caused great injury to the enamel of her teeth through lemon-sucking. He recommended carbonate of soda, in the form of a mouth-wash, with good results.

Mr. **MacFarlane** then read a paper upon "Obturators," which we publish at page 106.

Discussion.

The President said that the paper to which they had had the pleasure of listening, had been most interesting and instructive, but unfortunately it was not a subject which called forth any great points of discussion. They must all admire the pains and trouble Mr. MacFarlane had taken in preparing the specimens with which the paper was illustrated. Of course where staphyloraphy was successful, it was the best thing possible, but in many cases there was not enough natural velum to spare, and the result of operation was very unsatisfactory. Such cases, he thought, would give much better results under mechanical rather than operative treatment, while young, supplemented if possible, by a careful course of voice training. He had used an excellent rough and ready obturator, made by vulcanising a strip of metal (gold or dental alloy), flush with the palatal posterior surface of the plate. The piece of gold was perforated so as to allow a piece of india-rubber to be sewed on, of a thickness to bring its lingual side flush with the lingual side of the plate. This, when trimmed to suit the individual case, made a capital velum for hospital patients. One advantage was, that the patient could attach a fresh velum himself, by cutting out a piece of rubber to the original pattern, and sewing it on. He was indebted to Mr. R. D. Pedley for the suggestion.

The meeting then adjourned.

Dental News.

A COUNTY COURT CASE.

In the City of London Court, Mr. Frank Boyd, 19, Fetter Lane, E.C., applied for the committal of Mr. Louis S. Prager, trading as "The Dental Company," 213, Regent Street, for non-compliance with an order of the court to pay the plaintiff £22 due. The plaintiff's solicitor said that the defendant, who did not appear, had offered to pay £3 down and £1 per month, but he did not comply with the promise. The plaintiff's solicitor's clerk said the defendant had well-furnished premises and employed an assistant. The defendant seemed to be doing a good business as a dentist.

Mr. Commissioner Kerr: He calls himself the Dental Company, does he? Then I must assume that he is able to pay.

An order was accordingly made for the committal of the defendant for forty days in default of payment.

THE utilization of the well-known property of aluminum to lower the fusing point of iron is a very neat and clever application of a curious phenomenon.

Silver is the metal which seems most useful in improving aluminum. Five per cent. silver gives to aluminum elasticity, which is wanting in the pure metal, increases its hardness, and is capable of being polished, and does not injure its malleability, or much increase the weight. This alloy is excellent for handpieces and handles of instruments. It is about as hard as coin silver, and is not affected by sulphuretted hydrogen; hence it does not easily tarnish.

Correspondence.

[The Editor does not hold himself responsible for the opinions expresse by his correspondents.]

PISCIDIA ERYTHRINA IN CASES OF DENTAL PERIOSTITIS.

To the Editor of the "British Journal of Dental Science."

Sir,—Having used "Fluid extract of Jamaica dogwood," for a year in cases of Periostitis, and inflammation of the mucous membrane surrounding the teeth, I find it a very valuable application as it is Anodyne, and a mild Rubefacient in its action, and is more agreeable to the patient than Aconite with Iodine, which irritates the parts applied to, and does not give as good results.

Treating a patient a few months ago with a swollen face, complaining of severe toothache, and very much depressed in health, I found on examination the superior left lateral incisor was decayed, and the nerve dead; but the periosteum was inflamed as by concussion it gave rise to great pain, the neighbouring teeth were tender, and the inflammation involved the palate, and cheek. I opened the pulp cavity, dressed it antiseptically, and applied "Fluid extract of Jamaica dogwood" on a camel's hair pencil to the surrounding tissues. When the patient returned in a few days, I found the inflammation very much reduced, and the pain greatly minimised; continuing the treatment for a fortnight the inflammation and pain entirely disappeared. I then filled the tooth in the usual manner, to the entire satisfaction of the patient, and myself.

My object in contributing this paper is not to claim priority for the use of the above drug for Dental purposes; but to advise those who are in search of an effective Anodyne and mild Rubefacient to give Fluid extract of Jamaica dogwood a trial. Yours faithfully,

DAVID B. BRADLAW.

Dublin, January, 1894.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
6. The Journal will be supplied direct from the office on PREPAYMENT of subscription as under:

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SOME CAUSES OF IRREGULARITIES.*

By John P. Headridge, B.Sc. Lond.

Mr. President and Gentlemen,—I must in the first place apologise for bringing up again the old standing dish of Irregularities, but I thought perhaps it might be interesting to us all to direct our attention to-night to a few of the facts we know about the causes of Dental Irregularities rather than the many various methods of treating them.

I think it will simplify my paper considerably if I first try and give you a rough classification of Dental Irregularities, and then follow that classification in my endeavour to point out the factors which appear to give rise to these dental troubles.

Classification.

A.—Irregularities in the Temporary Teeth.
  (1) During period of eruption.
  (2) In position.
  (3) During shedding.
B.—Irregularities of the Permanent Teeth.
  (1) Accidental irregularities.
  (2) Irregularities in shape and structure.
  (3) Irregularities depending upon the Alveolar Arch.

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* Read before the Students' Society, Victoria Dental Hospital, Manchester

I think the divisions of the two great classes explain themselves quite clearly. Accidental irregularities, I may mention, include such irregularities as :—

(a) Entirely misplaced teeth, *i.e.* canine lying horizontally in the palate, &c.

(b) Teeth which are apparently entirely absent from the arch. These may simply have failed to erupt or their germs may never have developed.

(c) Irregularities clearly traceable to some accidental cause, such as early extraction of the temporary canines leading to malposition of the permanent successor.

(d) Some cases caused by injudicious habits during period of cutting the permanent teeth, for example, thumb-sucking, etc.

This, gentlemen, is not intended to be either a complete or theoretically correct classification, but will no doubt serve our purpose to-night.

(A) Irregularites of Temporary Teeth.

(1) During eruption, these irregularities consist of variations in the normal time of eruption, or excessive constitutional disturbances during that period. Little is known about the causes of these irregularities, so I think we need spend no more time over them, or over the second class, irregularities in position, as these are rare and scarcely need be mentioned,

(3) Irregularities during shedding of temporary teeth call for a few words, not so much from their own importance, but rather from their close relation to the first class of the next division.

In Tomes's Dental Surgery it is pointed out that temporary teeth are often found, the fangs of which show clear evidence of periods of growth alternating with periods of absorption.

Cementum of the fang is first absorbed and then portions of dentine ; there then comes a period of growth during which the portions of dentine which have been absorbed are built up again by cementum.

Absorption may follow, and this again may be succeeded by a period of growth. Traces of periods of growth and absorption are often particularly well marked on temporary teeth which have remained in their place long after their normal time for shedding.

These traces of periods show us clearly how closely metabolism and katabolism are connected even in the absorption of the fang of a temporary tooth.

In other parts of the body we find that a very small cause is sufficient to convert metabolic processes in an organ into katabolic changes, so evenly are the two balanced in the normal state of affairs.

I think if we now combine our knowledge of metabolism and katabolism in the body generally with what we know about absorption and the deposition of cement on the root of a temporary tooth, we can clearly see a relation between the absorption of the temporary root and the growth of the permanent tooth.

The cells of the growing permanent tooth absorb all the tooth-forming substances from the blood and lymph supplied to that part, consequently the supply of these substances is lessened in the tissues in close proximity.

We now get lessened supply of tooth-forming materials for the temporary fang. Thereupon the metabolic changes are decreased and the check taken off the katabolic changes and the final result is that the root is freely absorbed by the odontoclasts. We may almost say that in the normal condition of temporary and permanent teeth, the growth of the permanent tooth is perhaps the determining cause of the absorption of the temporary root.

At this point I may remark that apparently the root of a dead temporary tooth is less easily absorbed than that of a living tooth. In this connection one may remember that to extract a temporary tooth before the roots are absorbed is certainly to rob the child of a definite amount of tooth substance which would under favourable conditions probably go to build up the growing permanent successor.

We now come to the consideration of the Irregularities of the Permanent teeth.

(1) Accidental Irregularities. Under this head we get a well defined sub-group consisting of those irregularities which have been caused by the retention of temporary teeth and their roots.

This sub-group is characterised by the ease and certainty with which we can generally diagnose the cause.

For example, a temporary tooth decays and eventually dies before the fang is absorbed. The permanent successor on erupting is consequently forced out of its proper position.

The mal-position of this single tooth may lead to many various derangements of the other teeth; with these I need not trouble you.

We may say then that in any one of these irregularities we can go back to the temporary tooth and find that one of them, by the non-absorption of its fang, originated the trouble.

But we must notice further that the primary cause is contained in the answer to the question ;—What is the reason for the non-absorption of the root? To this question we can give no decided or satisfactory answer. The question is not even answered if we take it that the temporary root was dead, as it is not quite clear why a dead root should be less easily absorbed than the root of a living tooth. Of the other irregularities under this head I need say but little;of some of them, such as entirely misplaced or transposed teeth, one can say no more than that they are freaks of nature, which is just saying in another way that they are irregularities.

(2) Irregularities in shape and structure of the teeth.

Syphilitic teeth may be simply mentioned ; little more is known of them than that they are characteristic of inherited syphilis.

Similarly, mention may be made of enamel nodules, geminated teeth, and dilacerated teeth. The causes of these irregularities are not sufficiently well known to detain us.

Honey-combed teeth. With these we ought to include some particularly Chalky teeth in which the enamel is poor in quality without being apparently deficient in quantity.

In chalky teeth, we can easily see how the poverty of the enamel is due to general malnutrition during its development, leading to intermittent calcification of the enamel prisms.

Honey-combed teeth are generally admitted to be due to constitutional disturbances occurring during their formation The malformation of the enamel may be very varied, from 2 or 3 pits arranged in a horizontal line across the tooth to an almost complete absence of enamel over the greater part of the crown. In many of these latter cases we get a well-marked band of sound enamel round the neck of the tooth.

In a tooth like this we can trace the different periods at which a child suffers from illness. This permanent record of the periods of malnutrition seems to me very interesting when we compare the effects on the teeth with the comparatively transient effects on the other organs of the patient. The enamel of the tooth is in all points closely comparable to the outer cornified layers of the epidermis. Both these tissues are developed from the same embryological layer of cells, the ectoderm. The stratum corneum consists of degenerated epidermal cells, and I think we ought to recognise enamel as due to the degeneration of the cells or degenerated products of the cells of the enamel membrane.

Now we know that injuries to the epidermis are only repaired by the growing layer of cells next to the dermis, and those cells which have become separated from this layer cannot multiply or reproduce themselves under any circumstances.

Similarly in the enamel, those cells which have begun to give rise to enamel cannot reproduce themselves, if they are injured sufficiently to cause their death. Consequently death of a single enamel cell after it has begun to give rise to enamel leads to a permanent dwarfing of the enamel at that point.

But *only* at the growing point of the enamel membrane can we have new cells formed which eventually may give rise to normal enamel prisms, if their supply of nutriment is constant and normal. These considerations I think fairly clearly help one to understand why we should have a permanent record cf period of malnutrition in the teeth alone.

We now come to the last division of the irregularities of the permanent teeth. Irregularities depending on the alveolar arch.

In some very rare cases we get the alveolar arch large enough to give rise to abnormal spaces between the teeth, but the usual fault is that the arch is too small, and we get the many various forms of crowded arch.

Crowded arches are perhaps the most common of all dental irregularities. The shape of the arch need not detain us, more than just mentioning the three recognised shapes: normal, V-shaped, and saddle-shaped. One may point out that there is an infinite variety of forms intermediate between these three, as well as an infinite number of different degrees of crowding. The causes which give rise to these crowded arches seem to be very difficult to define. Several different hypotheses have been brought forward. Perhaps we really have a number of different causes, any one of which may give rise to a crowded arch.

In the first place, there are without doubt many cases in which the crowded arch is clearly hereditary, and in which we can see the characteristics transmitted in a more or less marked degree in the children. These cases of heredity with clear history must naturally be very few.

Secondly, a still smaller percentage of these irregularities may be explained as excessive *variation*. All living organisms tend to reproduce themselves, but always with a greater or less variation.

Then a certain number of the crowded arches which come to us for treatment, may be due to heredity or variation. But it is quite certain that heredity and variation cannot explain anything like all the cases of crowding. This is especially evident when we consider the very few irregularities we find among little civilized races, both of the past and present time. The two causes mentioned would clearly act just as fully on ancient or modern savages, as on highly civilized races.

This brings us to the conclusion that there are other causes at work among civilized races besides heredity and variation. Several solutions have been offered.

1. Modern civilized races are of mixed blood. For example, the English and Americans are of very decided mixed blood. Now animals of mixed blood do not as a rule breed true. Their offspring exhibit the characteristics of one parent, blended with those of another. Might not large teeth be transmitted from one ancestor, and small alveolar arches from another? This on the face of it, looks a rather tempting hypothesis, but it is untenable.

The alveolar ridges are not preformed for the reception of the teeth, but grow up synchronously with them, so that if large teeth develop in the dental sacs there must be at the same time large alveolar processes formed for their reception, if their eruption occurs in a normal manner. Take into consideration domestic animals. We have, at any rate in dogs, many cross-breeds, bred between parents of very different sizes, but I think you will all admit that irregularities in their teeth are very rare. We may then, I think, look upon this hypothesis with considerable distrust.

2. Degeneration theory. Many writers on irregularity lay much stress on degeneration in size of the jaws as the cause of many of the crowded arches. They say that in modern times the size of the jaw has considerably decreased. This is owing to the little muscular effort required to masticate the soft food at present the fashion. They point to frequently dwarfed laterals, and absent, or dwarfed wisdom teeth, and the frequency of crowded dental arches, as clear and conclusive evidence.

In the first place, there is the objection that the size of the alveolar processes cannot depend on muscular action, but must depend upon the size and position of the teeth round which they form.

If the jaws are degenerating, why should we not find evidences of this degeneration in the temporary set of teeth? No one has yet complained of the frequency of crowding among the milk teeth. From the study of Hawaiian skulls, Dr. Whitney points out that he finds in skulls which are undoubtedly several hundred years old, just as many non-erupted wisdom teeth as he would expect to find in a similar number of modern skulls. Now the ancient Hawaiians appear to have lived on very simple coarse food, so that in this case at any rate one can hardly lay down the loss of the wisdom teeth to soft diet.

How much irregularity of the wisdom tooth was due to close intermarriage among the Hawaiians we cannot say. Dr. Whitney further points out that other irregularities were not common, but makes especial note that among the present generation of Hawaiian children there is, he believes, just as large a percentage of irregularity as we would find among English or American children.

Further, if degeneration is going on, why should we not find that the teeth themselves are being perceptibly reduced in size as well as quality?

I think then that we cannot take non-eruption of the wisdom tooth as a proof that the jaws are degenerating in size and that we must not take the degeneration theory as being fully proved.

We find then that neither degeneration, nor heredity, will fully explain the causes of crowded arches. Since there is no irregularity in the milk teeth we must look for the cause of these malformations after or during the shedding of these teeth.

Dr. Kingsley puts forward the hypothesis that irregularities are due to the too early stimulation of the brain, leading to disturbance of the centre for the fifth nerve, this showing itself in premature eruption of the permanent teeth.

One cannot clearly see why the fifth nerve should be the only nerve which is affected, and that trophic disturbances at its centre should lead to eruption of the teeth before the jaws are ready for their reception. One would expect, if stimulation leads to too rapid growth of the teeth themselves, that it would also lead to rapid growth of the alveolar processes at the same time. Even in the face of this consideration one feels tempted to believe that there is something in this idea that the unnatural conditions in which children are brought up encouraged to overtask the brain at an early age. and spending their childhood and youth in the schoolroom instead of in the open air, may have something to do with the causes of irregularity. But we cannot clearly trace the connection between the two.

Any way, from Dr. Whitney's observations we find evidence that dental irregularities have certainly increased among the Hawaiians, since the children have been brought under the influences of modern civilization.

We may also further note that in savage and little civilized tribes, only the most healthy children survive the troubles of childhood. But among civilized races the lives of children are more carefully preserved, and we must therefore have a number of delicate children growing up to adult lives with permanent and clear traces of their weakness impressed certainly on the structure of the teeth, and possibly on the positions of those teeth.

One may then say that it seems probable that many of these crowded arches are due to a great extent to survival of weakly children, and also to the too early stimulation of the brain, at the expense of the rest of the body.

In conclusion, we have seen that the following factors are probably at work in giving rise to the different forms of irregularity found among the Permanent teeth of the modern civilized races :—

I. Retention of temporary roots.
II. Heredity.
III. Variation.
IV. Disease. Syphilis and Malnutrition.
V. Unhygienic conditions of childhood.

Now, gentlemen, that closes what I have to say on "Some Causes of Irregularity," and all that remains is for me to beg you to excuse the many apparent traces of incompleteness in my paper : but when I tell you that during the last few days I have been suffering from the after effects of the influenza, you will no doubt judge the faults leniently.

Perhaps the best dryer for root canals is hot air. If a common valveless chip-blower be exhausted of air by pressure upon the bulb, and the point be held just above the flame of a gas burner or alcohol lamp, it may be filled with air as hot as desired. If now the point be placed in the cavity, a current of air so hot that a few blasts will raise the temperature of the whole tooth above the point of comfort may be injected This will dessicate it completely.—*Dental Practitioner.*

NEURALGIA.*

By Mr. James Wood.

Mr. President and Gentlemen,—The subject I have chosen for my essay this evening—Neuralgia—is not a rare one, but one with which every practitioner is constantly coming in contact.

I have no new ideas or theories to propound, but simply offer you a collection of matter gathered from various sources.

The term neuralgia is used for a special kind of pain, felt in the course of a particular nerve and its branches, and not referred solely to the peripheral extremities of the nerve, and is defined as severe pain produced by irritation of a nerve, or by sympathetic action, with inflammation of surrounding tissue; a disease chiefly of over-work, debility and general depression. It is found generally in early adult and middle age, being most common between 20 and 60, and is rather more frequent in women than in men. It is frequently hereditary. When occurring in the head it is termed tic-douloureux. The pain is deep-seated, spreading along the course of a nerve trunk, or radiating with its branches, and is variable in character—sometimes shooting, stabbing, boring, burning, gnawing, or throbbing. In its duration it varies considerably; it either lasts only for a short time, for minutes or hours, and then subsides entirely, to return after an interval of hours or weeks, or it is continuous over long periods in a moderate degree, with moments of great severity from time to time. After it has continued in one of these forms for some little time, the "tender points" may usually be recognized; these are spots on the surface of the skin, which are tender to firm pressure. They lie in the course of the affected nerve or its branches, and correspond to the points of exit of the nerve from a bone, or where it perforates the fascia, and sometimes where it passes over a hard surface, or where the nerve divides into two branches, and where two nerves anastomose.

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* Read before the Students' Society, Victoria Dental Hospital, Manchester.

There is often some tenderness of the skin over the painful part, which may last after the pain has subsided, for some little time.

Since the neuralgia of the fifth nerve is more closely connected with our branch of the profession, we will speak principally of it, passing over the other forms of neuralgia by simply mentioning some of them.

There are the cervico-brachial and brachial neuralgias, which occur with pain extending over the area of distribution of the brachial plexus.

The cervico-occipital neuralgia which occurs with pain in the region of the upper four cervical nerves, and over the back part of the head. Tender points are found where the great occipital nerve becomes superficial, in the posterior triangle over the brachial nerves and over the parietal eminence; the last is common to this and trifacial neuralgia. Occipital neuralgia may be excited by diseases of the teeth.

Intercostal neuralgia, which gives pain in the course of an intercostal space.

Lumbo-abdominal neuralgia, in the lower dorsal nerves, affects the lower half of the trunk.

A crural neuralgia occurs in the region of the lumbar plexus. This form is rare. Sciatica has been described as neuralgia, while the pain is generally caused by neuritis, an inflammatory disease of the nerves, arising from direct injury, &c.

Next we come to the neuralgia of the fifth nerve, which to us is the most important of all. It seems to have been thoroughly established by the recorded observations of some of our eminent men, that dental irritation may give rise to neuralgia in many nerves, and more particularly in the branches of the fifth nerve itself.

Perhaps it would be as well, here, to recall the anatomy and ganglionic communications of this nerve, as the pathological conditions and symptoms cannot be correctly understood or duly appreciated without an accurate knowledge of the anatomy of the parts concerned.

The fifth or the trigeminal is the largest of the cranial nerves, and it arises by two roots, a large or sensory, and a small or motor.

Its superficial origin is from the side of the Pons Varolii, a little nearer to the upper than the lower border. The deep origin of the larger or sensory root may be traced between the transverse fibres of the Pons Varolii to the lateral tract of the medulla oblongata, immediately behind the olivary body. The two roots of the nerve pass forwards through an oval opening in the dura mater, opposite the internal auditory meatus ; here the fibres of the larger root enter the Gasserian ganglion, while the smaller root passes beneath the ganglion, without having any connection with it.

The Gasserian ganglion lies in a depression near the apex of the petrous portion of the temporal bone, just within the cranial cavity, and thence the three divisions of the fifth pass from the cavity ; the first or ophthalmic division through the narrow portion of the sphenoidal fissure to the orbit ; the second or superior maxillary, through the foramen rotundum, and the third or inferior maxillary, through the foramen ovale, to make their exit into the spheno-maxillary fossa.

The ophthalmic, or first division of the fifth, is a sensory nerve. It supplies the lachrymal gland, the eyeball, the mucous lining of the nose and the eye, and the integuments and muscles of the eyebrow and forehead. It is the smallest of the three divisions of the fifth. When this division is affected with neuralgia, the pain is felt in these parts.

The superior maxillary division supplies the side of the nose, the upper teeth, the lower eyelid, and upper lip, joining with filaments of the facial nerve. If this division of the nerve is attacked with neuralgia the pain extends over the cheek, between the orbit and the mouth, and to the alæ of the nose. The inferior maxillary nerve, or third division of the fifth, distributes branches to the lower teeth and gums, the integuments of the temple and external ear, the lower part of the face and the lower lip, and the muscles of mastication ; it also supplies the tongue with one of its special nerves of the sense of taste. It is the largest of the three divisions. If the third division is affected with neuralgia, the pain spreads over the parietal eminence, the temple, the ear, the lower jaw, and the tongue. The chief tender points are over the mental foramen, and over the auriculo-temporal branch, at the back part of the temple, and just above the zygoma in front of the ear.

These tender or painful points are a common symptom of "true" neuralgia ; but are by no means invariably present or confined to it ; for it has been shown that they may be present in neuralgia of dental origin. It is said that tenderness over the first and second cervical vertebræ is very characteristic of true neuralgia of the fifth pair.

Although in most cases of dental neuralgia, pain is confined to the various branches of the fifth, in any of which it is common, it may extend to the side of the neck, to the shoulder, and even to the arm of the affected side.

Among the exciting causes of neuralgia, impairment of the general health takes the first place, either from overwork, mental or physical, over-lactation, prolonged fatigue, overstimulation of the eyes, severe emotion, traumatism, exposure to cold, irritation of the nerves near the periphery, alcoholism, malaria, etc.

Neuralgia is a pain caused by an irritation somewhere else, intermittent, though the irritation be continuously present, and is liable to continue after the removal of the irritation. The pathology of neuralgia is certainly very obscure; but the fact that it is always associated with some form of vascular disturbance, has been attested by the best authorities. Whenever any changes have been observed in nerves affected with neuralgia, they have been those of simple inflammation.

In severe temporal neuralgia the temporal artery may be easily felt violently pulsating on the affected side, and Dr. Lauder Brunton described at a meeting of the Odontological Society, how by controlling the vessel, he had been able to control the neuralgia also. This experiment has been frequently repeated with satisfactory results. Nussbaum and others have successfully tied the carotid artery for obstinate neuralgia, showing, in that way, that they considered the phenomenon to be principally vascular.

The late Dr. Gross has described a remarkable kind of neuralgia, which occurs in edentulous jaws or in spaces where teeth have been extracted. In these cases the pain is generally distinctly localised in the wasted alveoli, and the gum covering them. It occurs exclusively in elderly people, and comes on gradually, proceeding from bad to worse. It is more severe at periods of depression, like other forms of neuralgia, and is often relieved temporarily by the administration of quinine.

Dr. Gross explains as the pathology of the affection that the minute nerves distributed through the wasted alveolar walls have undergone compression from the deposition of osseous matter in the canals.

After the failure of other remedies, he resorted to the excision of the affected portion of alveolus, and in most cases effected a permanent cure. The general surgeon comes across such cases in his practice. If for any reason a nerve trunk has been left longer than it ought to have been, so that in the healing of the wound it has become enclosed in the cicatrix, then difficulty arises, and frequently he has to make a second operation to relieve the pain. This, I think, is more common in cases of amputation.

Again, there is the neuralgia named by Trousseau, Epileptiform, which has very probably never been traced to the irritation set up by diseased teeth.

In neuralgias of the trigeminus, the pain usually affects *one* of its three principal branches. This may be the first, second, or third; but the second and third are more frequently the seat of the affection than the first. The pain may be apparently located in the trunk of the nerve or in its terminal branches. In the forms of neuralgia that are caused by a diseased pulp, the pain is first felt in the second or third branch of the trifacial, but very soon affects both.

The actual exciting cause of the neuralgia may often be unnoticed, and a tooth with an exposed nerve may, without betraying its guilt by any local pain, give rise to secondary pain, which may display itself in another, and perhaps a healthy tooth, often the corresponding tooth of the other jaw or the other side.

It is, also, important to bear in mind, that a totally wrong cause may be assigned to the pain. Underwood points out a case of neuralgia that was due to irritation of the eye definitely referred by the patient to a healthy bicuspid tooth. When the pain is confined to the tooth or its immediate surroundings, the term odontalgia is used; but so soon as it spreads along the fine branches of nerves to the small trunks from which they spring, it is no longer strictly local, and must no longer be considered as odontalgia, but as neuralgia.

In neuralgia, the pain is intermittent, although the primary cause be constantly present, whereas in odontalgia the pain only remains while the irritation remains.

The diagnosis of the cause of neuralgia of the fifth pair, is exceedingly difficult. Should a patient so suffering apply to us, our first care should be a thorough inspection of the teeth. We must not content ourselves with simply a visual examination, but must percuss all, especially those connected with the divisions of the nerve most affected.

The application of heat or cold may aid in the detection of the origin of the pain. The heat may be applied by means of a hot instrument, such as a burnisher, placed to the crown of the tooth; this may be required to be done several times before any response is given. The cold may be applied on a little cotton-wool dipped in ice-cold water, or better still a little ether.

Failing to get a decided response to any of these tests, it must be remembered that it is always possible to have hit upon the time between the death of a pulp and the supervention of alveolar inflammation. Again, the situation of the pain will often throw some light upon the matter; though irritation applied at any part of the fifth nerve may give rise to pain at any other.

Taking this into account, the points of lesion may be indicated by causing pain in certain parts. For instance, when the pain is most severe about the parietal region, the affected tooth is generally far back in the upper jaw; if it is referred to the eye, the tooth may be found in any part of the upper jaw. Pain referred to the ear, or the region of the tempero-maxillary articulation, generally indicates a lesion in the lower teeth towards the back of the mouth.

It may be in "true" neuralgia, that a tooth becomes tender after every attack, and yet not be the cause of the mischief, or a tooth that is the cause of the neuralgia may not show any abnormal tenderness on percussion or changes of temperature; as for instance, in cases where a formation of secondary dentine has been the cause.

It must be remembered that the trifacial nerve is a frequent seat of neuralgia from causes entirely occult or remote from the teeth; and these may even affect the teeth themselves prominently.

Amongst the causes of neuralgia the following may be enumerated :—chronic inflammation of the pulp; difficult eruption of the wisdom teeth; secondary dentine in the pulp cavity; decomposition of a dead pulp in a confined space; exostosis; alveolar periostitis, which may depend on the escape of decomposing matter through the pulp canal, or on roughening of the root by absorption; exposure of sensitive dentine (rarely); and, in fact, almost every diseased condition which affects the teeth. Besides these, facial neuralgia may be due to periostitis in any of the bony canals through which the nerve trunks pass. Inflammation of the mucous membrane, or the periosteum of the antrum, may involve the superior dental nerves which pass along the antrum in open grooves, and not in bony canals. The pressure of a small tumour on a nerve, some irregularity of the bone, or a cicatrix involving a nerve, any of which may cause neuralgia.

It appeared in the *Dental Cosmos* some few months ago, that trifacial neuralgia had been frequently met with during an attack of influenza. The pain occurred without any special localized points; the patient complaining first of one tooth and then another, and yet on careful examination no dental pathological lesion could be found.

By far the most common cause of dental neuralgia is chronic inflammation of the pulp. It rarely results from acute affections of the pulp. In these cases of chronic inflammation the pulp will be found to be healthy except at one spot, where there will be a small superficial patch of chronic inflammation, and so long as the exposed nerve escapes acute inflammatory attacks, no pain may be felt in the tooth; though if the exposed nerve be touched with an instrument, a severe attack of neuralgia may generally be brought on.

Neuralgia brought on by the difficult eruption of any of the permanent teeth, but especially by the wisdom teeth, may in some instances be due to the gradual elongation of the roots pressing upon, and diverting from their course the nerve trunks. Again, we have neuralgia brought on by the formation of osteo-dentine in the pulp cavity of a tooth. A case of this kind is reported in "*The American System*," where a lady had been suffering from neuralgia for about twelve months. She had been treated by a physician without any benefit. The pain was confined to the left side of the face and head, with occasional darting pain in the neck, shoulder and arm. On going to the dental surgeon all the teeth were examined; many of them contained small cavities, but the pulps were not exposed. On percussion the patient experienced a "curious" feeling in one of the upper molars. He opened up the pulp chamber, giving but little pain to the patient, and with a fine pointed instrument made an examination and discovered a bundle of semi-bone-like material in the pulp cavity. After the removal of this, the neuralgia disappeared. There are also cases recorded where a formation of secondary dentine in the pulp cavity caused pressure on the terminal branches of the nerve, and so induced neuralgia. It is said that the pressure of a filling may also produce the same symptoms.

In the above mentioned work, there is a remarkable example described, showing how severe neuralgia was brought on by extensive exostosis of the roots of a number of teeth. The facts of the case are as follows: The patient was a lady who had been suffering excruciating pains in the face, the side of the head and neck. It was a clear case of neuralgia from which she had not been free for many months. She had tried numerous remedies, without getting permanent relief. On going to the dental surgeon, those teeth that were much decayed were extracted. When some of the moderately sound teeth were tapped the patient experienced severe paroxysms of pain. With her consent seven of these were extracted, each of which was very largely exostosed. After this the patient gradually recovered.

Neuralgia may be induced by an old root of a tooth which has been broken in at some previous time, and become entirely covered with gum.

Innumerable cases of a similar kind may be mentioned, as being causes of facial neuralgia.

We will now speak of the treatment. This includes the removal of the cause if it can be ascertained, the improvement of any general ill-health, which may excite or predispose to it, and the use of such drugs or other treatment as may modify the morbid condition of the nerve or centre. Often after the removal of the cause, such as carious teeth, the neuralgia does not at once cease, but is only lessened when other remedies are brought in to assist in putting to rights the altered condition of the nerve-centre. This fact should make one very cautious in recommending the removal of other teeth without giving reasonable time and other general treatment, such as tonics, for the symptoms to subside.

In all forms of neuralgia, the hypodermic injection of morphia in $\frac{1}{3}$ or $\frac{1}{2}$ grain doses in the course of the nerve, often produces wonderful effects, or $\frac{1}{2}$ grain to a grain of cocaine may be injected locally.

Chloroform, Belladonna, Menthol, and Opium, locally applied, are also valuable. The general condition of the patient should always be attended to, and the treatment directed to its improvement.

Good food, fresh air, tonics, such as cod liver oil, or other fat, iron, quinine, in large doses for adults, (from 5 to 8 grains), nux vomica, are always necessary. Among the remedies which are especially directed against the local disease are :—arsenic in full doses (5, 7, or 10 minims of the liquor), or small doses gradually increased : amm. chlor. in doses of 15, 20, or 25 grains, 3 times a day. Some writers prefer small doses (5 to 10 grains) repeated about every half hour of amm. chlor., as large doses at longer intervals do no good, and only make the patient sick. Potassium bromide in full doses, butyl-chloral-hydrate in 5 to 10 grain doses ; tincture of aconite in 2 to 5minim doses and Sulphate of quinine are also very popular remedies. Cannabis Indica, ether, valerian, turpentine, and nitro-glycerine, are sometimes useful ; and a small dose of brandy or wine will often give much relief. Counter-irritation may be applied by mustard or blisters. Electricity is sometimes of benefit.

When facial neuralgia is caused by chronic inflammation of the tooth pulp, the sacrifice of the tooth is not always necessary, for it may almost invariably be cured by destruction of the pulp with powdered arsenic, or temporary relief may be derived by taking a full dose of quinine, and if taken nightly an hour or two before the time of recurrence, will often avert the paroxysm. But when facial neuralgia is due to affections of the alveolar periosteum, or difficult eruption of the wisdom teeth, etc., the teeth should be promptly removed.

When all remedies appear to fail, the question of an operation is open for consideration, which will consist in exposing the nerve in a portion of its course, and either stretching or dividing it. The inferior dental branch of the fifth is most suitable for an operation, as division of the superior dental branch means a comparatively severe surgical operation.

The stretching of a nerve probably alters the condition of its vascular supply.

Temporary relief is often given by the extraction of sound teeth, in cases of "true" neuralgia; this is said to be due to the branches which give off the dental filaments being stretched or influenced by the extraction.

Nerve stretching, as a rule, only gives a temporary cure, but as it is the less severe operation of the two in case of failure, it is to be preferred to division of the nerve.

In obstinate cases of neuralgia, the division of the nerve has been performed with success. It is not an operation in favour of which much can be said. When the cause of the pain is peripheral it may succeed for a time; but when the cause is central, the operation is not likely to be cf service.

Mr. Tomes mentions a case in which he exposed and stretched the inferior dental nerve, as it issues from the mental foramen, through a small incision at the reflection of the mucous membrane from the jaw on to the cheek, but this only gave partial relief for a few days. After this, about half an inch of the nerve was resected; but this only gave very temporary relief. The inferior dental nerve was then divided at a point a little beyond the wisdom tooth, by the following method. This consists in entering the bone, upon the summit of the alveolar ridge, a little beyond the wisdom tooth, with a spear head drill, about one-eighth of an inch in diameter, its point being directed towards the angle of the jaw. Keeping the drill, which is worked in the dental engine, in the middle line, it can be felt to crush into the inferior dental canal. This is thoroughly broken up, and its contents destroyed by working the drill about a little. This operation makes a very little wound, which does not give the least trouble, and does not cause as much bleeding as in an ordinary extraction.

Another method of operating upon the inferior dental nerve was devised by Dr. Garretson, and described in the *Dental Cosmos* for November of last year. An incision is to be made in the soft tissue along the lower border of the body of the inferior maxilla, the tissues elevated so as to raise the opening upon the bone in a line over the inferior dental nerve, then holding the lips of the wound apart by retractors, the bone covering the canal is removed by a circular saw and bur driven by the engine. In this way the whole canal within the body of the bone can be exposed and the nerve removed, the soft parts being allowed to assume their normal position and close. The small scar from such an operation is almost unobservable.

The operations for the division of the inferior and superior dental nerves are very varied and numerous.

When the pain is limited to the inferior dental or distribution of the infra-orbital nerve, resection may prove useful; if it involves the whole distribution of the 2nd division, then removal of Meckel's ganglion may be attempted ; while in those dreadful cases involving the whole distribution of the 5th nerve, the removal of the Gasserian ganglion might be attempted.

In conclusion, gentlemen, I may say that in dealing with such a large subject, I have only been able to present to you some of the most important facts and methods, and these in a somewhat rough and broken manner.

Insanity is said to be due sometimes to dental irritation, and Esquirol, who was the first to point it out, says, "Among subjects of lymphatic and nervous temperament, the pains of the first dentition sometimes become the cause of insanity." And so with chorea, hystera, and the many visceral disorders, occurrences of which are sufficiently frequent during the teething epoch to lead our best writers on infantile pathology to class them as incident to dentition.—*Dental Practitioner.*

British Journal of Dental Science.

LONDON, FEBRUARY 15th, 1894.

CLAUSE III. OF THE DENTISTS' ACT.

We publish elsewhere in this number of the Journal an account of a prosecution at Plymouth, which deserves more than a passing notice. So long as the practice of dentistry is considered of sufficient importance as to bring it under legislative control, so long will there occasionally occur instances in which the ordinary legal machinery, provided for the purpose, must be put into action. As in many other analogous arrangements, it is a matter of experience that the forming of laws, however nicely negotiated, tends to bear hardly, or even harshly, upon the individual in order that the more numerous may benefit. One can even imagine that in some instances a strict application of a legal enactment may prevent a man, practically well qualified, from pursuing with a free hand, and as his own master, that avocation in life he is best fitted for. We have no special source of information as to the personal merits of the defendant in the case we are discussing, but we notice in the evidence that he was registered as a dental student, and that his employer had every confidence as to his ability. It may, indeed, be a case deserving of sympathy, and on a somewhat different, footing morally, with the ordinary run of prosecutions, but all this only makes the application of the law, and the magisterial decision, stand out in a stronger light. If we are correct in our belief that the issues raised in the present case have called forth, for the first time, an interpretation of some of the wording in Clause III., then it is manifest that this new departure is one of considerable moment. We have several times ventured to suggest that instead of agitating for a new, or an amended, Act of Parliament, it would be well first to test the full strength of the existing one on such points as could reasonably be brought within its scope.

It may be convenient to reproduce the provisions of this Clause in order to fully appreciate the position. It is enacted that no person, (medical men excepted) unless registered under the Act shall be entitled to take or use the name or title of "dentist" (either alone or in combination with any other word or words), or of "dental practitioner," or any name, title, addition, or description implying that he is registered under this Act, or that he is a person specially qualified to practise dentistry. By the more recent Medical Act of 1886, it was declared that the words "title, addition, or description" include any title, addition to a name, designation or description, whether expressed in words or by letters, or partly in one way and partly in the other.

Now it is a matter of common knowledge that in numerous instances dental practice is carried on by unregistered persons, who whilst carefully avoiding the assumption of the title "Dentist," have made use of other descriptions sufficiently similar to allow an ignorant or unsuspecting patient to believe that he was in the hands of a person specially qualified to practise dentistry. In the present instance the defendant does not appear to have assumed any title himself, but the words "Dental Surgery" appeared on the premises where he practised, and also on his visiting card. The defence seems to have been that the practice really belonged to a registered man, and that the defendant merely acted as assistant. We do not stay to consider the question of "covering" which was accidentally raised in cross-examination, but content ourselves by emphasizing what we venture to think is the salient point at present determined by this important case. It would seem that the use of a dental "description" applied to a *place* is as illegal as the assumption by a *person* of a dental "title," and that the association of such a description with an unregistered person's name brings him within reach of Clause III, although he may studiously avoid claiming, or responding to, the name of "Dentist." We imagine that the Magistrates may have been helped to their decision by a consideration of the case brought to their notice, in which the Royal College of Veterinary Surgeons successfully maintained that the use of the words "veterinary forge" by an unregistered man, was illegal.

THE MEDICAL DEFENCE UNION.—This association has just published its Annual Report and Statement of Accounts. The membership has risen to nearly 3000, with a guarantee Fund of over £4000, whilst the Finance account shows a surplus of some £400 over expenditure. The cases dealt with during the past year are briefly recorded in a schedule which proves interesting reading, one case, a libel action, costing over £300. We have previously referred to the desirability of an amalgamation between this Society and another working on analogous lines. We feel sure that many practitioners abstain from joining either in consequence of being unable to decide between them, and if such a consummation is eventually brought about there will be a large accession of new members. In the report before us, we find an account of the attempts to conciliate the London and Counties Medical Protection Society.

THE ROYAL COMMISSION ON OPIUM.—Some very remarkable evidence by medical men has been placed on record as to the results of opium eating in India. So far from any injury resulting, the action of the drug is described as being decidedly beneficial, and even necessary. Some of the witnesses speak very clearly on this point, and almost make one think that we, even in our more temperate clime, may possibly be overlooking our advantages by neglecting a few daily doses of opium! Indeed, Surgeon-lieutenant-colonel

Lawrie, of Hyderabad, thinks that its use would promote longevity and happiness just as it does in India. He has no hesitation in recommending the habitual use of opium in European children during the period of dentition; and suggests that in the case of people in arduous and responsible positions in England, such as engine-drivers and railway signal-men, it might keep their minds clear and on the alert while on duty.

DENTAL DOCTORS.—During last year several instances in which persons on the Dentists' Register assumed the title of "Dr." were brought before the Council of the Medical Defence Union. It seems to have been considered as an infringement of the Medical Act, and some of the Dentists were written to by the Secretaries of the Union and cautioned. This action, says the Annual Report, resulted in the use of the title being discontinued in many instances; but in one case, where the offence was persisted in, the dentist was reported to the General Medical Council. That Body, however, appears to have taken little notice of the matter, and we learn that the Defence Union intend to have the whole subject brought up again at a future session. It is said that in many cases there is a clear history of medical, or rather surgical, practice being carried on by the dentist in addition to his legitimate occupation. This would seem to raise the question as to the proper limits of dental surgery, a point we hope to touch upon when a suitable occasion offers.

FOOD PRESERVATIVES.—In a very interesting article communicated to the *Glasgow Medical Journal*, Dr. J. B. Russell points out the difficulty which at present exists of preventing the addition of foreign matters to articles of food. In his opinion the Food and Drugs Acts are wonderful illustrations of the inability of our legislators to give clear and effective expression to their ostensible intentions. There is good reason to believe that the use of so-called food preservatives now amounts to a phase of adulteration. Salicylic acid is found in foreign lager beer, lemonade, essence of coffee, wines and preserved fruit. Benzoic Acid, sodium fluoride, and sulphate of copper, are other drugs which the ordinary consumer, to say nothing of dyspeptic and other sufferers, may take unconsciously in food. According to Dr. Russell, the use of boracic acid covers the sale of stale milk, and though it can only rarely be required as a preservative, it is used all the year round both by wholesale agents and retailers, and it is dangerous to the health of children and invalids.

THE NATIONAL DENTAL HOSPITAL.—His Royal Highness the Duke of York, who has consented to become the President of this Institution, will formally open the New Buildings, at the corner of Great Portland Street and Devonshire Street, on Saturday, the 24th instant. The Royal visit will be made at noon, and we gather from advertisements in the daily press that subscribers who wish to be present should apply to the Secretary for tickets. It is expected that after His Royal Highness has inspected the premises, a speesh will be made by Lord Strafford, the Vice-President, and at the conclusion of the ceremony two tablets in the entrance hall will be unveiled. Of these, one records the gift of the new hospital by the Dowager Lady Howard de Walden, and the other the opening of the building by the new President.

THE LATE PROFESSOR BILLROTH.—This celebrated pathologist and surgeon died from heart disease on the 5th inst. As the *British Medical Journal* says, his clinic at Vienna has been for 26 years " a kind of surgical Mecca, to which scientific pilgrims from all parts of the world have resorted in constantly increasing numbers." In 1873 he first excised the larynx for cancer, and in 1881 he first successfully resected the stomach. The total number of his published books and papers amounts to about one hundred and forty, of which the *Lectures on Surgical Pathology and Therapeutics* are best known to English readers.

A Teaching University for London.—Although the report of the Royal Commission has not yet been published, its more important provisions have become known. The Commissioners are of opinion the existing University should be so reconstructed as to provide for the establishment of an efficient teaching university, without interfering with its present duties as an Examining Body for students from all parts of the British Empire. They recommend that the necessary changes should be effected not by charter, but by legislative authority, and by the appointment of a Commission with statutory powers as this method would avoid difficulty and delay on the part of the University. With regard to the medical degree for London students, we gather that it is not thought desirable that such a degree should be obtainable on the same terms as the ordinary licence to practise, and the University will still be able to require a higher standard of scientific knowledge. We do not find any mention made of a "higher dental diploma."

The Dental Review.—Dr. Harlan, who for some years past has been Editor of this well-known American Journal has relinquished his post and left for Europe to seek some relaxation after his arduous duties in connection with the Chicago Congress. Dr. Johnson now fills Dr. Harlan's place on the Review.

Abstracts of British & Foreign Journals.

PORCELAIN vs. GOLD WORK ON THE TEETH.

By Dr. A. H. Thompson, Topeka.

The artistic culture of the dental profession is creating a sentiment against the employment of gold in positions in the mouth which are exposed to view from the front. "It is the highest art to conceal art," and the exposure of gold in the mouth is very wrong by this artistic standard. The highest art in operations for the restoration of lost parts of the dental armature is to imitate nature as perfectly as possible. For the reproduction of lost teeth or parts of teeth gold is inartistic, in that it does not imitate the colour of the teeth in the least. We are compelled to employ it, however, in certain operations in which no other material can be made to give the same practical results and answer the same purposes. On account of its serviceability, and that alone, it has been extensively employed, and the long use of gold for dental operations has accustomed the public eye to its universal presence in the teeth. Custom has made gold the best tolerated of any incongruous foreign substance that can be used upon the teeth, and its serviceable qualities have demonstrated it to be the most useful. Therefore it has served a better purpose than any other material in restoring the lost parts of teeth, and its extensive employment by the dental profession for many years has been the means of bestowing inestimable benefits upon humanity.

But like all good things, it can be abused, and this has been the result of the unrestricted use of gold in the teeth. It is undoubtedly the very best all around material for dental operations, and its exposure in conspicuous positions is sometimes unavoidable in order to secure the best results, but in those positions we use it with regret that we can not do better. In inconspicuous positions, of course, its use is not limited, and it should be employed in fillings, crowns and bridges to the extent that may be the best for the denture. But in conspicuous positions its use has been carried to an extreme that calls for the loudest protests from the artistic culture of the profession. In labial fillings, in gold crowns on incisors, canines or bicuspids, and all such uses that are avoidable, the employment of gold is simply a barbaric display that is inexcusable and is revolting to good taste. Of course the use of gold bands and crowns on the anterior teeth is sometimes unavoidable for the support of bridges, but it is rare that a gold band need be made to show on the anterior teeth. Fortunately a sentiment is springing up and spreading among our patrons that protests against the show of gold, and that demands the concealment of foreign substances as much as possible in our restorative work. This sentiment is artistic; it demands a close study of nature an artistic restoration of lost parts with substances that shall imitate nature perfectly. It is our duty to cultivate this artistic sentiment and then demand of the inventive genius of the profession that it supply us with the means of following and imitating nature more closely than we can do at present.

First, as regards labial fillings. Few of our best operations are so unsightly or revolting to good taste as gold fillings upon the labial face of the upper incisors or canines, or worse still, upon the necks of these teeth where the gum has receded and caries has commenced above the enamel. A gold filling in this latter position is simply ghastly, and as they are avoidable they should be banished from our practice. With the various methods of fitting porcelain into these cavities, or of adjusting gum porcelain into these doubly unfortunate cavities on the necks of the anterior teeth, there is nothing to be desired to fill our demands in that direction. Artistic operations can be performed with porcelain that defy detection by ordinary observation from the front of the mouth—as in conversation or as persons meet in their daily intercourse. Of course very close inspection will discover the artificial nature of the operation, but ordinary observation will not, and this immunity is in marked contrast to the painful attraction that gold fillings in these positions always have. It is unfortunate that we cannot yet employ porcelain in proximate cavities or in the restoration of corners, but must use gold; but so far as we can, we are in duty bound to use it in cavities in inconspicuous positions, within its limitations, or we fail of our artistic duty to our patients.

In regard to the employment of gold crowns in conspicuous positions, there is no doubt but that there has been a too reckless employment of the precious metal for this purpose, by pretty nearly every practitioner that could work gold at all. There are few of us that can escape having this crime laid at our doors, for it is a crime against art and an outrage upon our boasted æsthetic age to have been guilty of this barbaric display of gold. But the reaction has set in, and we must keep up with and foster the growing public sentiment that demands more natural art and opposes the indiscriminating employment of gold. We must keep pace with this sentiment by imitating nature better and concealing unnatural materials As porcelain is the only material we yet have with which we can perfectly imitate the natural enamel, it is the best thing to employ for artificial tooth crowns. For the two teeth anterior to the molars—and sometimes for the upper first molars in women—porcelain should always be employed for crowns. That is the rule, but it has its limitations, of course. There are places where we must use gold, as in crowns or bands for the support of bridges, or in men where gold would seem to be stronger, and would be concealed. But a gold crown on an upper bicuspid in a woman's mouth is an unpardonable insult to true art, an unmitigated barbarism—except in unavoidable cases, which are unusual. When we have porcelain bicuspid crowns that can be set as readily as the porcelain incisors (or with the little gas furnace can be made so readily), there is no excuse whatever for the use of gold for bicuspid crowns.

Western Dental Journal.

ACUTE INFLAMMATION OF THE LEFT ANTRUM OF HIGHMORE AFTER INFLUENZA.

A PERSONAL OBSERVATION

By FELIX SEMON, M.D., F.R.C.P.

At the commencement of December last I had an attack of influenza, the third within two years. The acute stage was slight, and only lasted two or three days, but was followed by a very general and rather severe catarrh of the air passages. Whilst in this condition I had to go to Berlin. The journey did not seem to have aggravated the catarrh, and apart from rather severe spasmodic cough with little expectoration and considerable coryza with watery discharge from both nostrils I felt well and was able to go about as usual. On the 27th, however, in the evening, suddenly a sensation of fulness, which rather rapidly increased, made itself felt in my left cheek, at first unaccompanied by pain and strictly limited to that region. I happened to spend that evening with my friend, Dr. B. Fraenkel, the well-known professor of laryngology at the University of Berlin, and jokingly remarked that I wondered whether I was in for empyema of the left antrum. I did not think then that the joke was about to be so quickly realised as it turned out to be. After my return in the evening to the hotel, the sensation of fulness steadily increased, and soon amounted to a sense of almost intolerable distension of the zygomatic region. The skin over the part became distinctly swollen and reddened, and was very tender to the touch. Every effort by means of which the air in the nose and adjacent cavities would be condensed, such as blowing the nose, and especially coughing, was felt as most acutely painful, and about 11 p.m. my temperature was 100.5°. During the whole time, however, there was none of that frontal neuralgia which is so characteristic of the chronic forms of inflammation of the maxillary sinus. I spent a sleepless night, mostly in efforts at dislodging, by blowing my nose, what I was convinced must be an accumulation of fluid in the antrum, but although all the time there was an enormous discharge of watery fluid from both nostrils, such as I had had before the onset of the acute symptoms on the left side, no relief was experienced.

On the following morning, the condition had become, if possible, worse, when suddenly during a violent effort at blowing the nose, a large quantity (certainly not less than half an ounce) of turbid greenish sero-purulent fluid streamed out of my left nostril. This was followed by an immediate sense of great relief. I concluded that probably a pellet of mucus or purulent matter which had stopped the hiatus semilunaris had become dislodged, thereby allowing of an escape of the fluid accumulated in the antrum. To prove this further, I held my head downwards inclined to the right side, so that the opening of the antrum would be in the most dependent position, when a further smaller discharge of the fluid above described occurred.

I went and saw Professor Fraenkel, who, after cocainisation of the left nostril, did not find any matter in the middle meatus or indeed in the nose. On transillumination of my face, the two antra were both translucent, but my left pupil remained dark, a symptom to which of late attention has been prominently drawn in connection with affections of the antrum. For three to four hours after this I remained free from pain and inconvenience, then gradually a fresh accumulation began to take place with a recurrence of the symptoms above described. In the afternoon a second discharge occurred, again followed by relief; during the evening the fluid accumulated for the third time, and when discharged at bedtime was distinctly bloodstained. After this the acute complication seemed to have disappeared as suddenly as it had arisen, and I had almost forgotten it when, two days afterwards, on blowing the nose again, a large quantity of greenish fluid, this time of a distinctly mucoid character, was discharged. This signalised the end of the affection.

Whilst it is now agreed that chronic empyema of the antrum of Highmore is anything but a very rare affection, acute inflammations of that cavity must be exceedingly rare. Little will be found about them even in the special textbooks, and whilst I myself am constantly seeing a large number of cases of chronic empyema of the maxillary sinus, I have never actually seen a case in the acute stage, although in one instance of bilateral chronic empyema now under my care the disease also originated in a very acute form after influenza. My Berlin friends (Professor Fraenkel, Drs. Landgraf and Rosenberg) tell me that they have seen a few instances of the acute form, all of them after influenza, and that as in my own case, all these had spontaneously recovered, with one single exception in Dr. Rosenberg's practice, in which the antrum had to be opened from an alveolus in order to give exit to the distending fluid. This was also necessary in the case under my care just mentioned.

The points to which I would draw particular attention are: (1) The sudden and violent increase in the pain during sneezing or coughing; (2) the limitation of the pain to the affected region.

British Medical Journal.

OUR SAILORS' TEETH.

The announcement is repeated that no man is now eligible for admission to the Royal Marines who has defective teeth. The rule to which allusion is made is not altogether a new one, and is as follows; "Persons of whatever class or age are to be considered unfit for entry into Her Majesty's service if they have seven teeth deficient or defective (unless official authority is obtained from the Admiralty), or if the biting or grinding capacity be seriously impaired owing to a smaller number of absent or unsound teeth, for instance three or four of incisors or four molars in the same jaw." "The examining officer is also directed to take into account the condition of the teeth generally and the probability of their lasting." The Admiralty some eight years ago made an arrangement with the Dental Hospital of London providing that for a small annual payment the teeth of all recruits should be put in good repair. It is time that all recruiting stations and headquarters of regiments should have a dentist to take care of the teeth not only of recruits, but also of soldiers who are quite unable to pay a fee. Inasmuch as they are the servants of the nation, the Government should provide soldiers and sailers with properly-qualified dental surgeons to pay periodical visits at barracks, or dentists be appointed in all towns where depots are found to receive the men at the dentist's residence. The Navy has moved in the right direction by not only formulating the above rules, but also requiring of naval surgeons some knowledge of dental surgery, and instructing them at Haslar on this subject. This can only be tentative, and nothing short of the appointment of dental surgeons at the various depots, training ships, and barracks can be really satisfactory.

British Medical Journal.

DENTAL OBTUNDENT.

The following formula for a local obtundent has not the advantage of being a secret preparation ; it has no one to publish quack certificates in its favour, and there is no liar, gifted as such by nature and perfected by constant practice, to vaunt its merits. In all other respects it is quite equal, if not superior, to any of the nostrums now offered by every alternate cross-roads dentist to a long-suffering profession :

R	Atropiæ ...	grs. 1-10
	Stropanthii ...	grs. 1-5.
	Cocaine Mur ...	grs. 50
	Acidi Carbolici...	grs. 10
	Ol Carophylli ...	m. 3
M	Aquæ Destillate	ʒ 1

The Dental Practitioner.

Reports of Societies.

MANCHESTER ODONTOLOGICAL SOCIETY.

The usual monthly meeting of the Manchester Odontological Society was held at the Grand Hotel, Aytoun Street, on Tuesday evening the 9th January. The President (Mr. T. Murphy) presided.

Casual Communications.

Mr. G. G. Campion showed an appliance for adaptation to plaster models of Regulation cases, which enabled the models to be opened in the median line (for examination of the palatal and buccal surfaces of the teeth), as well as in the usual way.

The Late Professor Marshall.

The President said that since their last meeting an accident had caused the sad death of Professor Milnes Marshall. Through no fault of his own, the life work of this eminent man had been brought to a premature end, and they in Manchester mourned the loss of one who had done so much for the cause of scientific education. His loss would be felt not only in their midst, but he believed throughout the scientific world. He moved that a resolution of condolence be sent to his family, and a copy of the resolution to the public press. The resolution which supported by Mr. G. G. Campion, Mr. W. A. Hooton, and Mr. David Headridge and others was carried.

"SHOULD WE FILL ROOT CANALS?"

By Mr. David Headridge., L.D.S.

In order that the members might discuss this paper (read at a former meeting) to better advantage, Mr. Headridge at the request of the Society, again read his paper, which we published last year on August 1st.

Mr. G. G. Campion said the essayist was seeking to undermine the ordinary methods of practice which had grown up n the course of many years and as a result of many experiments. Mr. Headridge brought forward a number of reasons against the practice of filling pulp canals, but he had to get over the difficulty, that up to the present time no alternative method which had been adopted had yielded such generally beneficial results as the practice now assailed. There was no doubt there were cases as Mr. Headridge had said, such as tortuous and fine roots, and roots difficult of access, in which successful filling was next to impossible, but that did not touch those other numerous cases where root canals were not tortuous, were not extremely minute, were not difficult of access, and which were capable of being efficiently filled. There was no doubt, for example, that in the six front teeth, the incisors and the canines, as a general rule the practice of root canal filling was an extremely good one. There was no doubt that the results which were obtained in those teeth, where the nerve had been destroyed and the pulp had been removed and the roots filled, were good, but he should adopt a different treatment in cases where the pulp had become putrefactive, and which introduced other difficulties. But Mr. Headridge proposed as a general system of treatment not where the pulp was dead but merely devitalized, to leave the pulp canal empty, and satisfy themselves with filling one cavity or at any rate,the bulk of the pulp chamber. It seemed to him that the paper needed, before it could be a valid one, that it should be continued by a paper containing an exact description of the method which was to be adopted in place of the one that would be superseded. A very great deal of discrimination was needed in dealing with the different classes of cases that were met with in practice. Mr. Headridge made no such distinctions. and his paper was absolutely indiscriminate. To that extent therefore, his paper was unscientific, and a paper which sought to arraign empiricism at the bar of science must be scientifically correct. Further, in bringing forward a system to supersede a method which yielded in so great a number of cases such admirable results, it must be supported by a number of cases with exactly tabulated records; such records to extend over a period of not less than five years. Dr. Miller in a paper before the Chicago Dental Congress, in reference to statistics of this kind, laid it down as a reasonable condition that they must relate to cases which had been actually treated for a space of five or ten years. Until Mr. Headridge brought such tabulated results of his new system before them, it seemed to him (Mr. Campion) that it was hopeless to attempt to upset their present methods of practice. It would be absolutely wrong of them as dentists to adopt a practice the full value of which remained to be proved in the future. (Applause)

Mr. DOUGAN said he did not agree with what Mr. Headridge had said. The arguments he had used did not refer to the question of root fillings. In the roots he had mentioned as big failures, the difficulty was not in filling but in cleansing them. It seemed to him that Mr. Headridge must have a method of his own of rendering the canals aseptic without cleansing them out; some patent drug or other which found its way to the apex of the root of its own accord. If they could cleanse a canal they could without difficulty fill it. Professor Delèpine's letter seemed to be as much against as for Mr. Headridge's theory, because in it he pointed out the weak spot by saying that "if the stopping became loose the trouble would start again."

Mr. W. A. HOOTON said he thought the reason why Mr. Headridge had not disclosed his alternative method was because he had not got one. He ought to have come there with a second instalment of his paper before the discussion took place, containing the alternative. When the paper was postponed on its first reading, he ventured to say, as Mr. Campion had said that evening, that what they wanted was an immense number of tabulated cases, not only from the plan Mr. Headridge advocated, whatever that might be, but from other methods. In those cases in which flexible drills were used; in which they were not used; in which different methods of cleaning canals were adopted, etc.; and until they got these tabulated results they would not be able to decide which was the best method. Mr. Headridge said he went in for removing all septic matter from the canals. Very well, but he should remember that the process of doing that was the very thing which led to the trouble he sought to overcome. If they could obviate that they would obviate the failures. If Mr. Headridge adopted that method, he must have a certain percentage of failures. They ought not, he thought, to pay too much attention to Professor Delèpine's letter, inasmuch as he was not a dental specialist, although he did seem to have got hold of the most important points for consideration. If Mr. Headridge could close up securely the orifice of the pulp canal, he was doing more than most of them could. He was not now speaking of a crown cavity, where it might be possible with a thick layer of osteo to make it watertight, but of those cases where moisture got to the filling, opening up the pulp canal which became full of fluid, which soon decomposed and became foul. He (Mr. Hooton) thought that even theoretically it was better to fill the canal, and so prevent moisture getting in.

Mr. Whittaker said he quite agreed with the remarks of the preceding speakers. If Mr. Headridge could hermetically seal the root canal without filling it, he might leave it empty, but he (Mr. Whittaker) strongly doubted his ability to do so.

Mr. Collett also thought that Mr. Headridge's theory was wrong as it was impossible to prevent moisture getting to the filling.

Mr. Mansell said that the feeling of the meeting was decidedly against Mr. Headridge. He should, however, like to ask those gentlemen if they were quite certain they were able to clean out all the canals of those teeth when they devitalized the pulps. The lower molars, as they knew, had two canals, and were very difficult to clean out to the apices, as were the roots of the first and second upper molars. A good deal had been said about cleaning out the root canals perfectly, and filling with gold, etc. He must confess that in many cases he himself was not able to do that. He therefore had to leave some of the devitalized nerve substance in the canals, but for all that he did not think the filling of the tooth would be a failure in one, two, or even three years. In fact, he knew of cases where he had left a part of the pulp, and the teeth had gone on satisfactorily for years. If they could not clear them out, how could they render those canals perfectly aseptic? There was dead matter in the teeth. What did the gentlemen who had spoken against Mr. Headridge's treatment propose to do in such cases? Were they justified in filling the tooth, and sending the patient away?

Mr. G. G. Campion (interrupting), said they all knew it was impossible to clear out every canal. What they objected to was making a practice of necessity a practice of principle. It was quite absurd to say that because they could not clear out all pulp canals they should leave them all empty.

Mr. Mansell (continuing), said he did not wish it to be understood that he left pulp canals unfilled. Quite the contrary. His argument was this:—If they were going to leave devitalized matter in a certain number of roots with confidence, why should they not leave it in all roots, with equal confidence?

Mr. Collett pointed out that whatever substance they were compelled to leave in the root they tried to make it as aseptic as possible.

Mr. Simms said the best answer to Mr. Mansell's query was that those cases in which they were obliged to leave pulp tissue in the canal were the very cases which contained the greatest number of failures.

Mr. P. Headridge said the essayist was right as far as the nerve was concerned, provided the nerve was devitalised. If it were thoroughly done, the tooth might be filled and remain in the mouth undisturbed. He did not, however, agree with the theory now advocated. He said that the writer of the paper had raised questions of very great importance which had not hitherto received adequate attention. While not agreeing with the theories now advanced, there was no doubt that in some cases nerve tissue might be left in the canals without apparent harmful result, but it was important that where so left the nerve should be severed at the apex of the root, so as to have no living connection with the branch continuing to the main trunk.

The President said that he had gathered from the tone of the paper that Mr. Headridge did not lay down the leaving empty the pulp canal as a *sine qua non*, but simply brought the matter up for discussion. There was one thing certain, that was, that with the more thorough practice now in vogue, they did not find the same number of abscessed teeth as formerly. With regard to the points raised by Mr Mansell, he (the President) believed that one reason why they did not clear out the canals properly was because they were in too great a hurry to fill the teeth. He had profited very much by the hint given him by Mr. Fletcher, of Warrington, viz., that where they could not get all the pulp out of a canal they should treat what remained in with Tungstate of Soda, which converted it into a leathery substance, and over that they might safely fill the tooth.

Mr. David Headridge, in replying, said he must express his disappointment at the scientific value of the affirmative arguments used in the discussion, especially considering the numerous articles bearing on this question which had appeared, since the reading of this paper, in the Dental Journals; and more particularly did he regret that so many of the members had mistaken the objects he had in view in opening a discussion upon this important question. Having exceptional success in filling pulp canals, he nevertheless felt that there was a void in dental literature with regard to the reasons of filling pulp canals, though the most philosophic—and that but cursory—consideration of the question, with which he was familiar was to be found in the writings of Mr. C. Tomes. Feeling that the negative side was essentially the weaker part of the argument he had tried to advance these in an impartial spirit. It was essentially therefore a discussion of principle and it would be futile to enter into a detailed consideration of every condition under which filling of the pulp canals became necessary. Any one who had read his remarks carefully would see that it was presupposed that it was taken for granted that external conditions had been treated, and the surrounding tissues brought into a fairly healthy condition. In the second place, there would follow as a corollary to his line of argument that greater danger was to be feared from a too energetic treatment of pulp canals, in pumping action, and reaming fine or tortuous passages, than in leaving them alone after rendering the contents aseptic where it was not possible to freely remove the contents without endangering the propulsion of matter likely to cause an infective periostitis, an opinion to which he still adhered. He urged, in conclusion, that it was most desirable to exercise the greatest care throughout *all* the treatment of pulp canals.

Discussion on the Demonstrations.

Mr. W. Simms in opening the discussion on the Demonstrations performed at the previous meeting, said that there were three demonstrations performed at the last meeting, viz.:—On the administration of Pental, by Dr. Stallard; the Filling of a Labial Cavity with Gold, by Mr. Petit; and the Preparation and Filling of a Root Canal, by Mr. Mansell. Mr. Simms said that from what they saw of the action of Pental at the demonstrations, and from what they had read since in the Journals they would probably agree with him that Pental had some serious disadvantages in comparison with N_2O gas, which would prevent its coming into general use. Mr. Petit's demonstration of ligaturing an incisor tooth preparatory to filling a labial cavity was an exceedingly valuable one, and would be very helpful to them in their practice. Mr. Mansell's demonstration of the filling of root canals raised anew the question they had been discussing in regard to Mr. D. Headridge's paper, but the subject was by no means exhausted, and they might with advantage discuss one or two points raised by the demonstration. After removing the contents of the nerve canal, Mr. Mansell relied for drying the cavity upon Japanese bibulous paper rolled between the finger and thumb into pointed cones which he claimed were more efficacious than cotton-wool. He (Mr. Simms) preferred, however, to use cotton-wool wound round a Donaldson bristle. From experiments he had made, he found that while well-prepared cotton-wool and bibulous paper were both very absorbent, cotton-wool more rapidly absorbed moisture than bibulous paper. He (Mr. Simms) also preferred to thoroughly dry the cavity with hot-air; he thought they needed a much more effective instrument for this purpose than any now on the market. The ordinary Chip Syringe so much in use speedily became foul, and might itself easily be the means of introducing septic matter into a tooth canal. The ideal hot-air syringe would have a continuous blast, and allow no return of air through the nozzle. Mr. Simms commended the use of the Donaldson Pulp Cleanser where enlargement of the canal was desirable, as by their use the minutest canal could be entered and enlarged.

The President said he agreed with the remark of Mr. Simms about Pental. It was, in his opinion, too dangerous a drug to use.

Mr. Mansell, in reply, said that his demonstration was intended to show them how root canals could be filled with the saving of a great deal of time and labour. He never attempted to drill out the root canals. If he could get a fair opening into the pulp cavity he cleared out the canals as well as he could. He had no trouble in the majority of cases. He then dried the canals with the paper points, then pushed up some iodoform and oil of cinnamon paste, afterwards filling the canals with the points. He had found his method very successful, and the paper points far superior to cotton wool.

The President thanked Mr. D. Headridge and the gentlemen who had given demonstrations.

The proceedings then terminated.

STUDENTS' SOCIETY, VICTORIA DENTAL HOSPITAL, MANCHESTER.

Third general meeting, December 12th, 1893, the President, Mr. F. W. Minshall, in the chair. The minutes of the previous meeting were read and passed.

The following gentlemen were balloted for and unanimously elected members of the Society, viz : Messrs. E. F. B. Beyer, B. North, M. R. Leeming, J. J. Breakell, C. B. Dalby.

There being no casual communications, the President called on Mr. J. P. Headridge to read his paper, entitled "Some causes of Irregularities," which we publish on page 145.

At its conclusion, the PRESIDENT, in opening the discussion, complimented Mr. Headridge on the originality of his paper. He considered, however, that the question of the absorption of temporary roots preceding the eruption of their permanent successors, was not so vague as the author had endeavoured to make it. In his opinion, he always regarded these temporary roots as foreign bodies, whose casting off was a normal and natural process. Moreover, he regarded the hereditary and variation theory improbable ; for if this hypothesis was accurate, he contended that some symptoms of it would appear in the temporary set. He himself attributed many irregularities in the permanent teeth to malnutrition.

Mr. J. A. LEES spoke of the association of enlarged tonsils with irregularity of the whole maxillary arch. He also referred to the deformity produced by the too early extraction of the six year molars causing interdigitation of the permanent teeth.

Mr. D. HEADRIDGE thanked the reader personally for his able paper. He cited authorities who regarded irregularity in position of the temporary teeth as the result of lancing the gums, which produced a dense fibrous tissue or cicatrix constituting an impediment during eruption. Speaking of the permanent teeth, he inclined to Kingsley's theory, which he believed accounted for almost all irregularities connected with them, whether in position or structure.

This concluded the discussion, to which Mr. J.P. Headridge suitably replied.

The PRESIDENT then called on Mr. J. Wood for a paper on "Neuralgia" which is published on page 155.

The PRESIDENT referred to the excellent paper they had just heard read by Mr. Wood, and expressed a wish that a deservedly hearty discussion would be its result.

Mr. H. **Dreschfeld** showed an electric tapping instrument—Dr. Mortimer Granville's percuteur—adapted for the cure of bad neuralgic cases. This resembled in principle the electric mallet used in dentistry, the head of the mallet being applied to the seat of pain. He also recommended antipyrin taken twice or thrice a day.

Mr. P. A. **Linnell** said that one of our late deans had stated that neuralgia of the fifth nerve was almost invariably due to an exposed nerve, and that whenever a patient applied to him for relief, he was practically certain to find this source of lesion. He, Mr. Linnell, had seen cases which had been treated by means of the electric current passed through the tissues at the painful point.

Mr. A. B. **Sibson** referred to the pathology of the disease. Its origin had been assigned to a functional disturbance of the nerve cells connected with the nerves. He emphasized the necessity of carefully examining the teeth and of filling any cavities which might be present. He considered that removal of the cause was not in itself sufficient to cure the disease, but local or general treatment should also be brought into play, such as rubbing the affected part with linimentum Ammon. Dr. Dreschfeld recommended the use of Tinct. Gelseminum in obstinate cases.

Mr. J. P. **Headridge** spoke of cases which had come under his notice where complete artificial dentures had been inserted, and neuralgia had resulted from the bite being too long or too short. In these cases pain was felt about the region of the condyle of the lower jaw, and on correction of the fault, the pain had disappeared.

Mr. **Wood** suitably replied to the points raised.

This terminated the proceedings.

ANNUAL DINNER.

The eighth annual dinner of the past and present students of this hospital took place on Saturday, December 16th, at the Grand Hotel, Aytoun Street, the President, F. W. Minshall, Esq., in the chair. This is the second occasion on which the dinner was conducted under the auspices of the Society.

A large number of guests were present, including Professor Young, dean of the Medical School, Owen's College, Mr. Thorburn, of the Infirmary; Mr. Coysh, Liverpool; G. G.

Campion, Esq., Dean of the Manchester Dental Hospital, &c.

The dinner was served up in the usual well managed style of this hotel. The toast of the "Queen" proposed by the President was honoured in the usual loyal manner, after which Mr. J. P. Headridge proposed the "Manchester Medical and Dental Schools.

This was responded to by Professor Young for Owen's College, Mr. Thornburn for the Infirmary, and Mr. G. G. Campion on behalf of the Dental Hospital. The "Dental Students' Society" was proposed by Mr. T. Murphy (Bolton), and ably replied to by Mr. J. A. Lees. Mr. H. T. Dreschfeld proposed "Our Guests and Visitors," for whom Mr. Coysh (Liverpool) responded.

The last toast, that of "The President," was admirably proposed by Mr. J. Theakston, and was drunk with musical honours. During the evening several members and friends promoted the enjoyment of the company with songs, recitations, &c.

Dental News.

IMPORTANT PROSECUTION AT PLYMOUTH.

At Plymouth Police Court, before the Mayor, (Mr. William Law,) and Messrs. J. A. Bellamy, George P. Rogers, and H. J. Howland. magistrates, Hubert Durham Duff, of 195, Union Street, was summoned for that on the 23rd January he, not being then registered under the Dentists' Act, 1878, and not being a legally qualified medical practitioner, used the description "dental surgery" thereby implying that he was registered under the Act, or that he was especially qualified to practise dentistry.—Mr. R. W. Turner, barrister of the South-Eastern Circuit, instructed by Messrs. Bowman and Crawley-Boevey, of London, prosecuted on behalf of the British Dental Association, and Mr. Percy T. Pearce defended.

Mr. Turner said the prosecution was brought under the third section of the Act which provided for the protection of the public and also for the protection of members of the dental profession who had taken their diplomas and gone through the necessary curriculum against those who had not become specially qualified to practise dentistry. He should prove that the defendant had, at 195, Union Street, Plymouth, used the description "dental surgery," and also that he had used it on his cards, thereby leading people to suppose that the person residing there was on the Dental Register, or was one properly qualified to practise dentistry. It might be contended that he was not liable, because he was there merely in receipt of a salary from a Mr. Passmore, of Exeter, but not being on the register he had no right to exhibit on his lamp outside the words "Dental Surgery." With regard to Mr. Passmore, his name did not appear at all, and there was nothing to indicate that the person practising there was not a properly qualified dental surgeon. In support of his contention he mentioned that in the recent case of the Royal College of Veterinary Surgeons against Robinson it had been held that the display of a sign outside the defendant's premises bearing the words "Veterinary Forge" implied that the defendant was a properly qualified veterinary surgeon. He submitted that, *a fortiori*, the use of the words" dental surgery" conveyed the same impression in this case.

Thomas Smith, clerk to Messrs. Bowman and Crawley-Boevey, of 21, Bedford-row, London, said he went to the defendant's premises, 195, Union street, on the 23rd January. He saw the defendant in his consulting room, and showed him a card bearing the inscription "Mr. H. Durham Duff, dental surgery, 195, Union street, Plymouth." He acknowledged that it was his card. It was an ordinary visiting card. He told him that he was there on behalf of the British Dental Association, which intended to prosecute him. Defendant replied, "I've been on the register, and it is not my fault I am not on now." He also said that the premises were those of Mr. Passmore, of Exeter, and that he was only manager. On the exterior of the premises there were various advertisements, which he described, and a lamp bearing on both sides the words "Dental Surgery."

Cross-examined: He had examined the Dental Register, and found that Mr. Passmore's name appeared there as a properly qualified dentist. The Register did not contain the defendant's name. There was a Register of Dental Students on which Mr. Duff's name did appear.

Mr. Pearce submitted that the prosecution had absolutely failed to prove that his client had not complied with the Act under which the prosecution was instituted. Mr. Duff was employed as assistant under a properly qualified dentist and he resided at 195Union street. The offence must be strictly proved, and he submitted that there should be no straining of the words of the Act in order to secure a conviction, and that it must not be secured by inference. They had the fact that part of the house was used as a dental surgery by, and on behalf of, a duly qualified dentist, and that Mr. Duff resided there as his assistant, or manager. If in another part of the house other people resided, as they did, and if any of them took lodgings in the part occupied by Mr. Duff, would they not be entitled to put on their card the words "dental surgery" as part of their address? That was what Mr. Duff had done with regard to his visiting cards. Mr. Passmore was the lessee of the premises; he was in the habit of doing dental work there on two, three or four days a week, and therefore the surgery was the property of a person who was entitled to have it, that the lamp bearing the inscription "Dental Surgery" was his property. In the wording of the Act they must be satisfied that his client had taken such a name as to lead persons to believe that he was a duly registered practitioner under the Act or that he was a person specially qualified to practise dentistry.

George Frederick Passmore, dentist, Esperanza, Exeter, was then called, and said he had had a branch business in Plymouth for the last eight years. His present Plymouth branch was at 195, Union Street. Though he had resided at Exeter, he frequently used his Plymouth premises for dental work—on two or three days in each week on an average. Mr. Duff was an assistant in his employ. He had paid for the lamp outside bearing the words "Dental Surgery," and for the other advertisements on the door, &c.

Cross-examined: He had full confidence in Mr. Duff as to dealing with any case which came there. He was aware of a circular issued by the Association directed against a practice described as a "covering." That meant when a properly qualified dentist had branch offices in other towns in which he used his own name and employed unqualified assistants. He took it, however, that a case of "covering," properly speaking, meant where the man whose name was used had no connection with the branch establishment.

The Mayor, after a short consultation with the other members of the Bench, said: This is a very important case, and the decision of the Court is, without reviewing what has been advanced by the learned counsel on either side, that the defendant be fined £10 and the costs. The Bench is unanimous in its decision. It is an infringement of the Dental Act.

Mr. Pearce: You find that the card is an infringement?

The Magistrates' Clerk (Mr. Wilson): On the whole case the Bench finds that the Dental Act has been infringed, and that the defendant, by his action, has implied that he was a fully qualified dental surgeon.

Mr. Pearce: By using the words "Dental Surgery?"

The Clerk: Yes.

Mr. Pearce asked that the card might be impounded pending further possible proceedings.

APPOINTMENTS.

Mr. Edwin Thistlewood has been appointed Dental Surgeon to the Warwick Dispensary and Cottage Hospital.

Mr. Frank Hampton Goffe, L.D.S. Eng. and Edin., Hon. Dental Surgeon Birmingham Dental Hospital, has been appointed Lecturer on Mechanical Dentistry at Mason College, Birmingham.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
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MICRO-ORGANISMS OF THE MOUTH.*

By J. HOWARD MUMMERY, M.R.C.S., L.D.S. Eng.

Some attention has lately been drawn to the investigations of Dr. Filandro Vicentini, of Chieti, Italy, on the cryptogamic flora of the mouth, and I have been requested to present these views in the form of a casual communication.

I am in the somewhat difficult position of having to describe these researches without being able to consult the original in English; no translation having yet been made from the Italian. I have had, therefore, to rely upon the author's summaries and letters, and upon the Italian description of the plates.

Dr. Vicentini's communications are comprised in three papers, communicated to the Royal Medico-Chirurgical Academy of Naples. The first, published in 1890, "On the Sputa of Whooping Cough;" the second in 1892, entitled, "New Bacteriological Studies on the Sputum, and on the Morphology and Biology of the Micro-organisms of the Mouth;" and a third memoir, published in 1893, on "Leptothrix Racemosa."

The question raised is, I think, one of considerable interest, although I venture to think there are very few among us who will be prepared to follow Dr. Vicentini on the paths of what appears like speculative deduction on which he has entered.

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* Read before the Odontological Society of Great Britain.

The author claims to have discovered a new form of micro-organism in the mouth, which he calls "leptothrix racemosa." This organism he describes as a very highly specialized one, resembling in its mode of reproduction the algæ—the class of cryptogamic plants immediately above the fungi.

As there is a good deal of misconception as to the real significance of the term leptothrix, I will commence by a short description of what is now understood by the term; I will then proceed to describe the organism which the author calls "leptothrix racemosa;" and finally, will deal shortly with Dr. Vicentini's views as to the significance of this organism, and its relation to the other bacteria of the mouth, as far as I am able to understand these views.

Messrs. Leber and Rottenstein, in their work on "Dental Caries," published in 1867, refer the organisms found in carious teeth to elements of the leptothrix fungus, and speak of them as characterised by the formation of a beautiful violet colour, when treated with iodine and acids. The term leptothrix was really indiscriminately applied to various organisms in the mouth, some of them giving the violet iodine reaction, some not doing so, some showing distinct articulations, others none at all; in fact, as Dr. Miller says in his "Micro-organisms of the Human Mouth": "Almost every living organism occurring in the mouth was designated by this common name. Hallier and many of his successors up to the present time adopted this view. The motile bacteria of the mouth were regarded as the swarm spores of leptothrix buccalis, the immotile (cocci, &c.) as the spores at rest. Elements of leptothrix buccalis were found everywhere."

The term leptothrix is now usually restricted to the forms of micro-organism which occur in the mouth as long, thin threads, which show no divisions or articulations, and which are not coloured violet by iodine and acids.

Very little is known with any certainty of the biology of the leptothrix forms in the mouth: they resist all attempts at cultivation on artificial media.

If a scraping from the fur which forms upon the teeth is examined under a microscope, a matted collection of organisms is found, chiefly made up of masses of interlacing filaments, enclosing in their meshes numerous micrococci and bacteria. To this thread-form, which is *un*jointed, and does not yield a violet colour with acids and iodine, Dr. Miller has given the name of "leptothrix innominata;" the micrococci entangled in the meshes he does not consider to have any genetic connection with the threads, although they were formerly regarded as its spores. These threads and granules take a yellow colour with iodine and acids, but have no violet reaction.

The long chains of bacilli which do show a violet colour with iodine the same author calls bacillus buccalis maximus, and the chains of micrococci which also show the same colour he names iodococcus magnus. Other straight or curved filaments, much resembling the bacillus buccalis maximus, but showing no violet reaction with the acid iodine, he calls leptothrix buccalis maxima; but whether this is a distinct organism from the bacillus buccalis maximus, or simply younger cells of the same organism, which in this stage do not yield the characteristic violet reaction, the author is unable to determine.

We thus see that leptothrix means very little as a strictly scientific term; it has been used as a convenient name by which to describe many various forms of micro-organisms in the mouth; and even when the subject is reduced to something more like order by the above classification, we are still in complete ignorance, so far, as to the life history of the leptothrix and the genetic relations of the different forms.

Dr. Vincentini has assigned to these organisms an importance even greater than they were supposed to possess before.

L. Racemosa.—The author proposes to change the name of leptothrix buccalis, in the old nomenclature (including the leptothrix innominata, leptothrix buccalis maxima, and bac. buccalis maximus of Miller) to leptothrix racemosa, in order to indicate its fructification.

This fructification or sporulation is only found in the upper layers of the leptothrix masses, whilst the old filaments of the same organism occupy, according to him, the deeper layers, and constitute what has been formerly described, generally, as leptothrix buccalis.

Dr. Vincentini advises that the outer surface of the white deposit upon the teeth be very gently scraped with a needle, and a minute portion about the size of quarter of a millet seed placed upon a glass slip, with a drop of a weak solution of lactic acid. This should be done in the morning, fasting, before there has been any abrasion of the surface by toothbrush or food.

The preparation should then be teazed out with needles upon the slide, adding to it a drop of a solution of iodine; the cover glass should then be applied and gently compressed to thin out the preparation, and it should be left to stain for about 15 minutes.

The preparation is then examined under the microscope, and according to the author, it is necessary to use a $\frac{1}{25}$ immersion lens to see the appearance he describes as resembling bunches of grapes.

He speaks of this as consisting (1) of the fertile filament or central stem with reserve gemmules inside; (2) the peduncles or sterigmata, arranged in six longitudinal rows;

(3) the sporules ; (4) a gelatinous protective envelope

The author says that the sterigmata or threads by which the sporules are implanted on the outside of the central stem cannot be seen with a lower power than a $\frac{1}{25}$. He describe other structures as the adult male organs, which can be studied with lower powers, and a younger condition of these male organs (antheride or spermogones) which are very minute. These, he says, are best treated with aniline dye, without washing the preparation. Dr. Vicentini is very anxious that the occurrence of these forms should be corroborated by others, and it is certainly very desirable that thorough examination should be made by competent observers for the purpose of corroborating or contradicting these descriptions.

I made two attempts with Dr. Miller in the summer to see these organisms, and we were both times unsuccessful ; but on one occasion lately, I certainly detected appearances very similar to those organs which Dr. Vicentini compares to grape bunches, and made drawings of them at the time.

The regular lines of rounded bodies, which the author considers to be spores, were plainly seen, and the central stem, but I was unable to see the minute peduncles, by which he describes the spores as attached to the central stem. The club shaped appearance of these bodies was also very evident, but so far I have been unable to see anything that I can identify as corresponding to the two forms of the male organs, although I do not consider I have done justice to the author in my search for these, and shall renew the attempt.

The forms which I saw certainly seem to be too regular in shape to be explained as an accidental accumulation of granules or micrococci, around an isolated filament (an explanation which has been given by some observers). Looking upon these appearances as representing the male and female organs of the leptothrix, Dr. Vicentini considers that this organism, in its mode of reproduction, shows analogies, both with the fungi and the algæ.

While however, we do not question the possibility of the existence of all the forms described by Dr. Vicentini, although at present his observations need decided confirmation by independent skilled observers, yet I think, in passing to the more theoretical part of the author's communications, we shall find it very difficult to follow him, or in the present state of bacteriological knowledge, to agree with him in his deductions. I cannot but feel, however, that whatever we may think, it is difficult to do full justice to the author's arguments without having the English translation before us. Dr. Vicentini considers that the forms of micro-organisms, hitherto known in the mouth, consist either of the inferior phases of this one micro-organism, the leptothrix racemosa in either the filiform state, the dissociated state, or the zoogleic state ; or, secondly, to the sporules detached from the female filaments (the grape bunches) ; or, lastly, to the male elements the antherozoids detached from the adult male organs, and freely swimming in the fluids of the mouth.

To the first group (the inferior phases of the leptothrix racemosa) the author refers the filamentous forms usually called leptothrix, the bacilli and the bacteria, as well as vibrio spirillum and spirochæte ; to the second group (the detached sporules of the female filaments) he ascribes the micrococci found in the mouth ; and to the third group (the detached male elements) he ascribes the comma-shaped bacilli and some other forms.

The author finds this same organism, the L. racemosa, in the sputum of whooping cough and other diseases, and goes so far as to consider several of the pathogenic bacteria, as the tubercle bacillus, the pneumococcus and the gonococcus, as derivations of the same micro-organism, and he traces various transition forms which he illustrates in his paper.

These statements are so very revolutionary, and the position seems to be such a very untenable one, that one feels almost inclined without having further proof, to pass over the theoretical part without further discussion. But some eminent bacteriologists have from time to time promulgated somewhat similar views, such authorities as Nägeli and Buchner having held that the species of bacteria are not fixed, but are affected by variations in external conditions. Zopf founded a classification of the lower fungi on the basis of this view of the instability of the species, and there is the famous saying of Nägeli, quoted by Frankel and others, which is as follows :—"If my view is correct, the same species in the course of generations take different morphological and physiological forms, which in the course of years bring about, sometimes the sourness of milk, or the acid fermentation of sour kraut, or the fermentation of wine, or the putrefaction of albuminous substances or the reddening of food containing starch ; sometimes producing typhus fever, cholera, or intermittent fever."

As Prof. Frankel says, if the above were correct, scientific investigation of bacteria would be an impossibility.

This view of the inconstancy of the species of bacteria has been rapidly losing ground, as the methods of securing pure cultivations have been more perfected, and much doubt has been thrown by Flügge and others upon the reliability of the earlier experiments undertaken without the strict precautions now found necessary in making pure cultures.

It is well known that many micro-organisms are pleomorphic, that is, they appear under different forms. Dr. Miller has described several of these organisms in the mouth, and in a recent letter he says he has lately repeatedly found in pulps, one kind which in pure culture shows two very distinct forms in the same colony, but in such a case the same organism always shows its own definite two or more forms as the case may be. These seem to be the definite morphological states of the particular organism.

Many micro-organisms when subject to abnormal conditions, such as insufficient or improper nutriment, exhibit the so-called involution forms, which are often very unlike the species in which they occur, but if the abnormal conditions are removed, the typical form is soon re-established ; no permanent change has taken place.

Dr. Vicentini's views differ, however, from those of Nägeli, and Buchner, in that he derives the different organisms of the mouth from the different phases and portions of one parent organism, and there are grounds on which some such opinion might perhaps be founded. For instance, in the last edition of the Encyclopædia Britannica, article "Fungi," the following statement occurs :—"In many fungi, no sexual reproduction is known to exist, but it is generally believed that in such cases the plants are merely members of a cycle of generations, the other stages in their life history being unknown or unrecognised."

Whilst in the higher fungi there is a true sexual reproducttion—both male and female organs being present—no such process has been traced in the fission fungi, with which medical research is chiefly engaged. They multiply by division, and, under certain conditions, by the formation of spores.

In reply to the remark that his deductions do not harmonize with the results obtained by extended experience in cultivating mouth bacteria, Dr. Vicentini says his "arguments go to prove that culture experiments are not conclusive in deciding these cases of genetic connection ; the inferior phases as in cultures being common to entire families, the fructification being the fundamental differential character of the cryptogamic species."

As Prof. Miller points out, how under Dr. Vicentini's view can we account for the many different pathogenic actions of the bacteria of the mouth? For instance, "a pure culture of the micrococcus of sputum septicæmia, one to two days old, will invariably kill a mouse or rabbit; a pure culture of some other bacterium from the same mouth, under exactly the same conditions, may have no action at all." This seems very extraordinary if they are all derived from one single form in the mouth.

It is quite possible that, as the study and knowledge of these lower fungi advances, and the whole life histories of particular organisms are most carefully worked out, it may be found that some of these organisms are only phases in the life history of a more complex one, as suggested by Dr. Vicentini: but it seems to the majority of observers very improbable that so many distinct forms, differing not only in appearance but in vital action, should arise from one parent form only. There seems in fact, so little on which to base this assumption, that one might, with almost equal justice, derive all the bacteria found in the body from this same organism; and I think the author would scarcely admit this.

I have endeavoured to explain Dr. Vicentini's views as well as I can with the small amount of material I had at my disposal in an available form; and while I do not wish to be held, in any sense, responsible for these views, I think they are of sufficient interest to engage the attention of a Society like our own.

ALVEOLAR ABSCESS.*

By Mr. J. A. Wood.

Mr. President and Gentlemen,—As this is one of the commonest diseases that the dental surgeon is called upon to treat, it may not be waste of time if we spend a little while this evening looking at the main points about it.

By "abscess" is understood "a formation of pus in any cavity, or in the substance of areolar tissue," or as Walsham describes it, "a circumscribed collection of pus, the result of inflammation."

Of course an "alveolar abscess" is simply the above condition occurring in the alveolus. The condition was described by Hunter, about 150 years ago, under the name of "gum-boil," which is still the popular name for it. Thomas Bell, I believe it was, about 50 years ago, who first gave to it its present name.

It is generally recognised in two forms—the "acute" and the "chronic." The acute attack usually lasts from 3 to 10 days, whilst the chronic is quite variable in its duration.

A glance at its pathology shows us that the abscess is caused by the lodgment of bacteria, principally, of course the staphylococcus pyogenes aureus, and the ptomaines which they generate, collecting at or near the apex of the tooth. Mr. Dolamore divides alveolar abscesses into two groups, (1) those commencing in the periodontal membrane, or between that membrane and the root, these he calls "sub-periodontal," and (2) those commencing externally to the membrane, these are called by him "extra-periodontal." The infection usually takes place through the pulp-canal of a decayed tooth, although abscesses have been known to occur in connection with teeth having live pulps. Dr. Hugenschmidt relates in a back number of the *Record*, some cases that he has come across. I have only been able to observe one at this hospital so far, but I believe that it was a genuine case of this sort. The bacteria having come in contact with the highly vascular periosteum, it speedily becomes inflamed, leucocytes are exuded from the capillaries and vessels which abound near the surface of the cementum, and ultimately pus is formed with the result that the periosteum is in many cases stripped up from the surface of the root, thus forming an abscess cavity, the periosteum does not form the wall of the sac in every instance however. The pressure of this exudation causes more or less absorption of the surrounding bone and bulging of the least resisting wall which is in most cases the outer one, a portion of this is eventually absorbed, and the pus, which is in a state of more or less tension, immediately finds its way under the periosteum of the alveolus and gum tissue. At this stage the cavity forms a sort of hourglass shape, the perforation in the wall of the alveolus being the constricted portion of the hour-glass and the inner and outer cavities, forming the bulbs. The sub-mucous and mucous tissues now ulcerate, and the abscess is said "to point," the pus being discharged through this sinus into the mouth in most cases. In some, however, the pus has burrowed for long distances before pointing has taken place. The inflammation has not confined itself to a definite localised area during the progress of the suppuration, but will have spread to the surrounding cellular tissue causing œdema of cheek, lips, &c., its extent differing greatly in different individuals. If the abscess is left at this stage without proper treatment, it usually subsides into a chronic condition, the sinus only closes temporally, and the inflammation is ready to be roused again by any external irritation, &c., when a mild form of the above again takes place.

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* Read before the Liverpool Dental Hospital Students' Society.

Causes.—The most frequent cause of alveolar abscess is, as we have already seen, caries resulting in death and suppuration of the pulp. In addition to this, there are mechanical causes which lead to the same result, some of which I might mention :—

(a) Violence either with or without fracture of the tooth, resulting in death of the pulp.

(b) The forcing of septic matter through the apical foramen in treating a dead tooth.

(c) Sealing up a septic canal or decomposing pulp without previous aseptic treatment.

(d) Broaches or other instruments forced through the apex or broken into the canal in attempting to clean out the pulp chamber.

(e) Perforating the side of the root when enlarging canals with drills, reamers, &c.

Amongst the *Predisposing* or *Constitutional causes* : Scrofula, debility, syphilis, mercurialization, small-pox, and the inflammatory fevers, are perhaps the chief. A strumous patient is of course exceedingly liable to inflammatory swelling.

We come now to the *symptoms* which I will consider under the heads of local and constitutional. The *Local* symptoms are identical early in the attack with those of periodontitis. The tooth will be found loosened and uneasy, steady pressure giving relief, as it drives the blood from the engorged vessels in the periodontal membrane. Later the tooth is still more raised in its socket and feels to catch during attempt at mastication if it has an opposing tooth; pressure upon it now gives extreme pain instead of relief, as stasis having occurred in the vessels, they can no longer be emptied of their surplus blood, and the pressure on the hypersensitive nerves of the membrane gives intense pain. The pain at this stage assumes more of a throbbing or boring character instead of the dull ache which characterises mere periodontitis, this throbbing indicates the formation of pus. The gum assumes a dark red appearance, accompanied by more or less œdema, but until the pus has perforated the alveolus this is usually well marked. In well developed subjects where the bones are hard, this perforation by the pus naturally takes a longer time and gives increased pain. Once the pus has perforated the wall of the alveolus, it usually does not take long to make its way to the surface. Immediate relief from the throbbing pain is experienced on the discharge of the pus, the swelling or œdema however, usually rather increases after this stage. This œdema varies very considerably according to the disposition of the patient, and the position of the abscess.

A swelling in the palate is nearly always associated with an abscess of the superior lateral, an abscessed palatine fang of the six-year molar also causing one in this region occasionally. The œdema from an upper central is most marked about the upper lip, also of nose and sometimes the side of the nose as high up as the eye. The upper canine and bicuspids cause a fulness below the malar bone which also extends to the eye ; with the upper molars the swelling is rather more posterior.

The lower first molar,—which is an exceedingly common tooth to abscess—causes a swelling on the body of the jaw just in front of the attachment of the masseter. The lower incisors very rarely abscess, the œdema being in the lower lip when they are affected.

The temporary teeth when they are attacked by alveolar abscess very rarely cause much swelling, the alveolar plate being so thin and soft that the pus readily finds an outlet before such diffuse inflammation has been caused.

The *constitutional symptoms* are not usually so severe as one would expect from the local changes. They are very similar to the general symptoms of an abscess in any other part of the body. In acute cases, the pulse will be quickened, and the temperature slightly raised. The tongue is foul, the urine scanty, skin hot and dry, and there are loss of appetite, constipation and the symptoms of general malaise.

Chronic abscesses do not give rise to any very definite symptoms, except that the patient seems debilitated, and occasionally to suffer from a sort of mild attack of sapræmia.

The *Diagnosis* is usually fairly simple, particularly when seen in the acute stage. It is perhaps most readily mistaken for necrosis of the alveolus, but that usually has more than one sinus. When the antrum is involved and becomes distended with fluid, or the alveolar plates are bulged, in the lower jaw, careful diagnosis will have to be made to prevent mistaking the condition for any malignant growth.

Messrs. Smale & Colyer mention in their very excellent book the following complications and sequelæ which may follow this condition.

(1) Inflammation and suppuration of the neighbouring lymphatic glands.

(2) Cellulitis of the muscles of the neck and œdema of the glottis.

(3) Post-pharyngeal abscess from burrowing of the pus between the deep processes of the deep cervical fascia.

(4) Pyœmia.

(5) Necrosis of the jaws.

(6) Closure of the jaws.

(7) Sinuses in the various parts where alveolar abscesses have broken.

There have been several fatal cases mentioned by Tomes, Salter, and others, where the pus from an alveolar abscess instead of discharging through the external plate of the alveolus has burrowed along under fascia, &c., for great distances.

Other results which have followed alveolar abscess are empyema of the antrum (from the upper teeth; particularly bicuspids and molars); cystic disease of the jaw; suffocation through bursting of sac during the night when the patient is asleep; erysipelas, meningitis, &c.

Treatment.—The *local* treatment for any abscess in any part of the body is to open into the suppurating cavity, and to provide *free* drainage and antiseptic surroundings. In the younger days of dental practice, the recognised line of treatment for alveolar abscess was in every case, extraction; but now that antiseptics are so well understood and used so largely, extraction is not, as you know, by any means the only cure. There are still, of course, some cases in which immediate removal of the affected tooth is called for, I have put down some that occurred to me.

(a) When the tooth has been the subject of chronic alveolar abscess for some long period; any other treatment under these conditions nearly always results in failure, as the root is generally extensively necrosed.

(b) In trismus, where the masseter muscle is infiltrated with pus or in a state of tonic contraction, usually associated with an abscess in an erupting wisdom tooth, and more rarely with abscesses connected with the other lower molars.

(c) In temporary teeth, as the exfoliation is sometimes rather extensive, and may uncover the forming permanent tooth.

(d) In crowded jaws, where room would be an advantage.

(e) When the affected tooth has no opponent in the opposite jaw.

(f) When a fistulous opening is through the skin, or very nearly so; if it has not actually burst and does not do so during the removal of the tooth a little "flexile collodion" may be painted on the surrounding skin for about an inch; this will help to support the weak spot.

The treatment by conservative means has been very conveniently divided by Tomes into two parts.

1st. Those cases where there is a fistulous opening on the gum (either spontaneous or obtainable by lancing), and

2nd. Where there is no fistulous opening.

In the first condition, provided it is not an old chronic case, a cure is comparatively easy. The root canal or canals had better be reamed out somewhat, but the apical foramen is better not enlarged. Then fairly strong carbolic acid (1-10) or other antiseptic must be pumped through the whole tract of the sinus; this can be forced through by fitting the point of a hypodermic syringe tightly (by packing of gutta percha or something like that) into the root canal and then forcing the fluid through; or, it can be sent through by the pumping action of a broach and cotton-wool. Tomes recommends that a piece of unvulcanised rubber be placed in the cavity and a large burnisher is then used to make pressure upon it in a succession of jerks; this would also produce the pumping action.

Carbolic or creasote is convenient to use, as one can see at once if it is forced out through the sinus as a small white patch will appear. If the carbolic has been made to pass fairly freely along the abscess tract, the root canal can be sealed up at once, and some dentists fill permanently at the first sitting, but it is safest done with two visits; at the second visit the abscess will usually have almost completely disappeared. If this has not happened it generally means that some necrosis of the root has taken place, a recent abscess almost always yields to this treatment. (Tomes).

In the second condition where there is no fistulous opening, the chances of success are not so good, as the two essential points in treatment, viz.: "drainage and destruction of septic matter," are not so easily attainable. Our cleansing of the canals must be done most cautiously, and on no account should any movement approaching a pumping action be used, as there would be great danger of forcing more septic matter through the apical foramen. We must be very careful not to put in tight dressings, and a drain should be left through the G. P. in the cavity. Dry dressings are very useful to leave in the canals until the next visit. Cotton wool soaked in a solution of corrosive sublimate 1-500 and then dried, makes a very good one, or dry iodoform on wisp of wool does very well. Bleeding the gum by leeches is recommended, and the application of counter-irritants such as tinct. aconite and iodine, iodine liniment, capsicum plasters, &c., is very beneficial. An astringent mouth wash may with advantage be used. If these means fail either to give relief, or to bring the pus to the surface, the part might with advantage be poulticed with a hot fig, or other medium for conveying heat to the part, any fomentation or poulticing being applied on to the gum over the diseased tooth, and not of course, to the outside of the face, as that would only tend to cause the pus to discharge externally which must at all times be avoided. Tomes recommends that an aperient be given in conjunction with the local treatment, and Smale and Colyer advise the same recommending a mixture containing:

Magnesiæ sulph.	gr. 60.
Magnesiæ carb.	gr. 20.
Aquæ menthæ piperitæ	℥i.
M. Mitte ℥viii.	

Two tablespoonfuls three times a day, to be followed by a tonic.

When the pus seems to have difficulty in perforating the alveolus, a good incision should be made with a sharp scalpel and the alveolar wall may with advantage be drilled through with a sharp bur or drill. Care of course should be taken that the instruments are quite sterile.

In those cases where the apex of the root (if it is a single rooted tooth) is necrosed and the sinus cannot be made to close, the end of the root is sometimes amputated by making a crucial incision through the gum with a scalpel and then drilling through the alveolar wall and so into the apex of the diseased tooth, the necrosed part is removed and the cavity treated antiseptically. This can only be done with single rooted teeth, more particularly the anterior uppers. For a somewhat similar class of cases Mr. Geo. Brunton recommends sponge grafting, which consists of passing a piece of sterilized sponge up into the abscess cavity through the root canal.

Extraction, amputation of apex, sealing of canal, and replanting the tooth has also been recommended and practised with some amount of success.

Electricity is becoming quite common for dental use, especially where a current is procurable from a street circuit. The devices used are not all satisfactory, and those which work nicely with some are not permanently successful with others. To harness electricity to our use we should make the whole subject a study. However perfect our apparatus, or abundant our supply, we shall have trouble if we depend on professionals to keep it in order. It would not be profitable to refer to particular devices. In nearly all sections there are some good, and improvements are so frequently being invented that the wideawake dentist will be as likely to find the best, as we should be to advise the best.

Items of Interest.

British Journal of Dental Science.

LONDON, MARCH 1st, 1894.

THEN AND NOW.

At first sight there would not, perhaps, appear to be much connection between two of the most recent and interesting dental events. But in congratulating Sir John Tomes upon a "golden" anniversary of his wedding, and the National Dental Hospital upon its New Building, we may be permitted, without forcing the situation, to trace some association of dental ideas. Those who took part in the pleasing pilgrimage to Caterham found an opportunity for referring to the great services rendered by Sir John Tomes to the Dental Profession. Apart from the benefit bestowed as a result of scientific labours (which tended to increase esteem for, as well as to be useful to, Dental Surgery) Sir John, in association with others, also still happily amongst us, proferred services which must be always remembered when one contrasts the present status of the profession with that which obtained before educational methods became systematised. The institution of a College of Surgeons' diploma, necessitated a curriculum, which required Schools; licentiates needed some State protection, in the shape of the Dentists' Act, and found it advisable to form a politico-professional Association in addition to the Scientific Society. All these stages lead us up to the present time, of which we are apt to boast that it is a great improvement upon the dark days of individualism, when the spread of dental knowledge was limited to the occasional, and often unintentional, leaking out of systems and methods practised by the more successful dentists. The professional edifice now opening its doors to students and young practitioners has been built up gradually, but is none the less substantial. Whilst there is a cry of complaint from many of the General Hospitals, several of which are, financially, in distress, it is satisfactory to find that Dental Hospitals are still able to prosper. As H. R. H. the Duke of York, the President of the National Dental Hospital, remarked in his speech at the opening of the New Building, the ordinary objections to Special Hospitals can scarcely be raised in connection with the Dental Schools. These latter are the natural outcome of the efforts of SIR JOHN TOMES and his colleagues. The authorities of the National Dental Hospital are to be congratulated upon having such a gift presented to them by the Dowager Lady HOWARD DE WALDEN, and although some may consider the title of the Institution has now become somewhat of an anachronism it still serves to remind us of a time when Dental Schools were few, and the Provincial Hospitals not in existence.

THE DENTISTS' REGISTER.—The Register for 1894, just to hand, is issued at a much earlier date than usual, and the Registrar (Mr. W. J. C. Miller, B.A.) has prepared some interesting statistics in connection with the new publication. Seventy-two additional Licentiates registered during last year, but the entire number on the Register is almost the same. There are now twenty-seven names appearing in the list of "foreign dentists," but it is noted that The General Medical Council has decided that diplomas granted by Harvard and Michigan are no longer registrable. As must be the case, the proportion of those on the Register who have a Dental diploma, keeps steadily rising year by year ; at present 26·48 per cent. are so qualified, the total being 1,277. Twenty-nine of those who registered as being in practice before 1878, have surgical qualifications.

THE ANTRUM AND INFLUENZA.—In our last issue we published an account of the personal experience of a distinguished laryngologist who suffered from acute inflammation of the antrum in connection with an attack of influenza. Since then a correspondent to the *British Medical Journal* narrates a similar history. He had a second attack of influenza, and the left side of the face became very painful and slightly swollen. The following day a quantity of thick dark yellow fluid came from the left nostril, and the pain diminished. The flow from the nostril continued, especially when the head was bent down. The doctor, no doubt rightly, considers he had acute inflammation of the antrum of Highmore. He is careful to mention he had two rather bad teeth in the upper jaw on the left side, a bicuspid and first molar, of which the latter had been recently stopped.

FRENCH DENTAL JOURNALS.—Our French contemporaries *L' Odontologie* and *La Revue Internationale D' Odontologie* have joined hands. We have received a copy of the first number of the new Journal, the result of this fusion, and notice that M. Paul Dubois is the editor in chief, with a publication Committee, representing both the former Journals, to assist him.

A CENTENARIAN WITH TEETH.—According to the Paris "Figaro," Dr. Brosy, of Havre, who a short time ago celebrated his hundredth birthday, possesses his complete set of beautiful white teeth. *Die Zahntechniche Reform,* in quoting the statement, satirically narrates the case of the manager of a well-known tooth manufacturer who displayed a strikingly beautiful set of bright white teeth, and who, at least, could truthfully say, they were his "own" teeth.

The Acari.—At the Annual meeting of the Royal Microscopical Society, the President, Mr. A. D. Michael gave an address on the growth and present state of knowledge of the Acari. According to the latest authorities there would seem to be more than two hundred genera. Although many of the predatory forms are without special organs of vision they are extremely active. One which is a parasite of the rabbit, lives in the fur, not to injure its host, the rabbit, but to feed on other parasites, which really are hurtful, and of these it destroys a large number. The so-called cheese mites were referred to in order to describe the stage in the life history of many of them, when the creature, which is originally soft and easily killed by heat and exposure, suddenly becomes hard and able to endure almost all vicissitudes. It is able to live for a long period without feeding, but is then provided with special organs for adhering to insects.

Artificial Teeth for Paupers.—Some time ago the Chichester Board of Guardians supplied one of their outdoor recipients of relief with a set of artificial teeth. What, indeed, is the good of a loaf of bread to one who is unable to masticate it? The Guardians seem to have reckoned without their auditor who, whilst not objecting to their logic, took exception to the item, and thought the amount of four guineas should be surcharged. However, all's well that ends well, and on further reflection the auditor intimated to the clerk that he had come to the conclusion that he had no legal right to surcharge the sum, as it was within the discretion of the guardians to grant relief in the form of artificial teeth if they chose to do so.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Annual General Meeting, January 8th, 1894. Mr. W. Bowman Macleod, L.D.S., President, in the chair.

The Minutes of the previous meeting were read and confirmed.

The President referred in feeling terms to the loss the Society had sustained in the deaths of Mr. Alfred Alabone, of Newport, Isle of Wight, and Mr. Robert Reid, of Edinburgh, who had been a member of the Society for twenty-five years.

The following nominations having been approved by the Council, were proposed to the Society :—Leslie G. Austen, L.D.S. Eng., 9, Wolsley Road, Crouch End, N. (resident) ; Leonard Brown, L.D.S. Eng., 7, Spencer Street, Clerkenwell, E.C. (resident) ; John Robert Freeman, L.D.S. Eng., 18, Arabin Road, Brockley, S.E. (resident) ; Edward Caleb Joseph Hall, L.D.S. Eng., 18, Orchard Street, Portman Sq., W. (resident; John Trevor Hankey, L.D.S. Eng., 128, Green Lanes, Stoke Newington, N. (resident) ; Philip Harrison, L.D.S. Eng., 36, Finsbury Pavement, E.C. (resident); Albert William Henley, L.D.S. Eng., 175, Victoria Street, S.W. (resident) ; Walter John May, L.D.S. Eng., Dental Hospital of London, Leicester Square, W.C. (resident); William Francis Mellersh, L.D.S. Eng., 2, Eastern Road, East Finchley, N. (resident); Frank Morley, L.D.S. Eng., 42, Albemarle Street, W. (resident); Harry Linsell Pillin, L.D.S. Eng., 33, George Street, Hanover Square, W. (resident) ; William Bertram Sansom, L.D.S. Eng., D.M.D. Harv., 84, Harley Street, W. (resident); Joseph Sefton Sewill, L.R.C.P. Lond., M.R.C.S. Eng., 40, Wimpole Street, W. (resident) ; Harold E. Bullen, L.D.S. Glas., 7, The Parade, Truro (non-resident), Ernest V. Coles, L.D.S. Eng., Montague Road, Uxbridge (non-resident) ; Arthur Curle, L.D.S. Eng., 30, The Parade, Leamington (non-resident) ; Albert John Gear Evans, L.D.S. Eng., Windermere, Clythe Park, Newport, Mons. (non-resident); Hedley H. Ham, L.D.S. Eng., Torquay (non-resident) ;

Frederick Haynes, L.D.S. Eng., 11, Hillmarton Road, Rugby (non-resident); Vacey Limington Hope, L.D.S.Eng., Wellingborough (non-resident); Charles Septimus Hall, L.D.S. Glas., 98, Abingdon Street, Northampton (non-resident); Percival T. Leigh, L.D.S. Eng. and Glas., Portland Crescent, Leeds (non-resident); Edward A. Manton, L.D.S. Eng., 14, Grand Rue, Boulonge (non-resident); Henry Charles Oram, L.D.S. Eng., 13, Royal Crescent, Cheltenham (non-resident); William Armston Vice, M.B., C.M. Aber., L.D.S. Edin., D.D.S. Phil., 5, Belvoir Street, Leicester (non-resident); Richard Ernest Woodcock, L.D.S. Eng., Pontefract, Yorkshire (non-resident).

The Treasurer presented his Report, which was adopted.

The Librarian reported that during the last year several books had been added to the Library by the kind donation of their authors and others, which had been duly acknowledged at the ordinary meetings of the Society. He regretted to report that, on taking stock of the books in the Library, several were not to be found. Some of these had been missing for many years, but others must, he thought, be in the possession of members who had accidentally omitted to enter their names, or to see them entered, in the book kept for that purpose, and he proposed to publish with the Transactions a list of the books which are missing, with a request that any member having any of them in his possession would notify the fact to the Librarian.

The Council, after carefully considering the question of the use of the Library and the borrowing of books, had decided to appoint a Sub-Librarian, who will be in attendance three evenings every week from 6.45 to 8.45, when members and visitors (on the presentation of the card of a member) would be able to use the Library for reading and reference purposes. They had found it necessary to restrict the privilege of borrowing books to members of the Society, as, with the rapidly-increasing number of dental schools and dental students, it was impossible any longer to extend it to students of the Dental Hospital of London. Dental students would however, in common with other visitors, be admitted to the Library on presentation of a member's card, and it was hoped that these facilities would greatly increase the use of the Library as a library of reference.

Since the last meeting, the three papers by Signor Vicentini, on which Mr. Mummery's paper of the evening was based, had been presented to the Society by their author.

The Curator presented the following Report:—He said: "As on former occasions at these Annual Meetings, it has not been considered necessary to enumerate the specimens that have been presented during the year, in consequence of their having been described at the meetings at which they were received, I do not propose on this occasion to inflict an enumeration upon you. But I would like to say that this evening we have had presented to us two models; one by Mr. E. Lloyd-Williams, of a probable exostosis of the palate, which has been in existence for a great many years. The patient is aged 45, and he has known the enlarged and hardened condition of this palate for at any rate twenty-five years. The other is a lower model presented by Mr. Andrew Wilson, showing what he describes as 'a conoid enlargement of the right lower temporary molar.' It is a very interesting specimen, and cannot fail to be of value to us in our collection.

"In speaking of the Museum for the year I would say that, in common with the Library, it is proposed in the future that a larger opportunity shall be afforded to members and visitors for availing themselves of the specimens that are in the Museum, since the Council has arranged for the Sub-Librarian to be in attendance on three evenings a week, viz., Monday, Wednesday, and Friday, from 6.30 to 8.30. He will, as far as possible, afford every facility to members examining specimens in the Museum, for finding individual specimens required; and any other help that he can render will be at their service. Visitors will also be admitted to the Museum on presentation of a card from a member; and, as it is not to be supposed that the Sub-Curator can know all members and visitors, each one will be requested to enter his name in a book to be kept for the purpose.

"In addition to the treasures contained in the Museum, the Council has also provided for the Society a microscope, which it is hoped will be found useful, not only at our ordinary evening meetings, but also to any members or visitors who wish either to examine microscopic specimens in the possession of the Society, or for microscopical sections which they may bring down for examination on the particular evening. I am sure the Council generally, and I personally, will be very glad to receive suggestions from any members as to the desirability of introducing any variation in the time of opening the Museum, or with regard to the usefulness, either of the specimens, or of the time of the Sub-Curator."

Mr. C. Robbins showed a combined mirror and drip point, and said for years he had been in the habit of using Stoke's drip point, but there were some places in the mouth that could not be well reached by that apparatus. There was also the objection that in changing the wheel, one had also to change the bend of the drip point, which was rather inconvenient, and in time it became bent and broken. It had occurred to him that if one could use the drip point secured to the back of the mirror, it would occasionally be useful. He therefore arranged a small contrivance that would fit the back of any glass of a certain diameter, with a small indiarubber connecting tube, and a ball filled with water, to be held in the left hand, for the purpose of throwing light, and at the same time water, to any tooth in either jaw. The difficulty at first was in working on the right side of the mouth; but, after eight months' practice, he found that by always working from the left, whether it was used on the left or right side of the jaw, any part of the mouth could be reached. A second and simpler form of the instrument dispensed with the loose arrangement, which made it a sort of universal thing. As a matter of practice, he found that it was better to stick to one glass, and there was nothing gained by changing it from one to another. The arrangement was simply a little bit of metal tube soldered obliquely to the back of the mirror, and could be carried out in one's own workshop. Notwithstanding the fact that one was rather apt to look on one's own child with favour, he still thought that the apparatus would be found useful to those who might adopt it.

Messrs Ash and Son had arranged to make some from the second pattern shown.

Mr. J. Howard Mummery was called upon to read some notes on the recent investigation of Dr. Vincenti on the micro-organisms of the mouth. His communication is published on page 193.

Mr. Storer Bennett said he had had the opportunity of seeing the patient whom he had brought down that evening, and who presented such very unusual characteristics as to make his case one of very great interest for members of that Society. He was a man aged 23, a "leader up" of stained glass, in which work he had been engaged for seven years; but as far as could be ascertained, his occupation had nothing to do with his present condition. He had never suffered from any of the ordinary symptoms of lead-poisoning, either colic, drop-wrist, paralysis, palsy, or anything of the kind. Therefore, any view might be laid aside as to his present condition having resulted from his occupation. On examining the mouth, the mucous membrane of the gum in the upper and lower jaw was found to be extremely swollen, very soft, and deep red in colour, but at the same time, not very vascular. On touching the surface with an excavator, even if it was inadvertently pushed through some of the soft mucous membrane, no bleeding whatever, or only a very slight lip bleeding, followed. The man stated that all his life, up to within four months ago, he had suffered from a slight tendency to hæmorrhage, more particularly from the gums, but at that period it ceased, and very shortly afterwards the swelling of the gum commenced. Looking at the case for the first time, one was apt to think that it was an ordinary hypertrophy of the gum, but as soon as the swelling was felt it was noticed to be perfectly different from such a condition. It was not hard, but on the contrary, very soft, and readily pulled away from the teeth. It almost entirely enclosed the back teeth, and some of the front ones were very deeply embedded in it, but the gum could be pulled away right to their necks. A very small amount of tartar was noticed on the necks of the teeth, but that did not seem to be accountable for the overgrowth of the gum. Taking a blunt instrument, one was quite unable to pass it up by the roots of the teeth. There was no discharge, no escape of blood, when the part was touched, and, although the teeth were more or less loose, there was no pain whatever, and the man was perfectly free from any difficulty in eating. The gum of the palate on the left side was exceedingly enlarged, forming a perfect ridge, so that one's finger could be hooked round it. Curiously enough, the same condition appeared on the inner side of the lower jaw on the opposite side of the mouth. When he came into the Middlesex Hospital, under Dr. Cayley, three weeks since, it was on account of a roseolar rash, which very soon yielded to treatment. The case was shown to Mr. Hulke and to Mr. Bland Sutton, who said they had not seen such a case in a human subject. Both agreed, however, that horses were subject to it, and that veterinary surgeons were familiar with it under the name of "lampas." In America, the treatment adopted was to give the horses free purgatives and then put them at once on green food, the gums quickly resuming their normal condition. The condition occurred in the spring of the year, when the horses had been kept on dry food for several months. In such cases they were noticed to refuse their food, and the gum was found exceedingly swollen.

On the motion of Mr. F. J. Bennett, seconded by Mr. Mummery, the proposed alteration in the by-laws with regard to the date of the Annual Meeting was carried. By this resolution the date of the Annual Meeting was changed from January to June, and it was agreed, on the motion of the President, that the officers elected that evening should hold office until the next Annual Meeting which would take place in June, 1895.

The President declared the following list of officers duly elected :—

President, Frederick Canton ; Vice-Presidents, resident, R. H. Woodhouse, Ashley Gibbings, A. W. Barrett ; non-resident, F. H. Balkwill (Plymouth), W. E. Harding (Shrewsbury), George Henry (Hastings). Treasurer, S. J. Hutchinson ; Librarian, W. A. Maggs ; Curator, Storer Bennett ; Editor of the Transactions, Edward Lloyd Williams; Honorary Secretaries, C. Robbins (Council), J. F. Colyer (Society), C. Woodhouse (Foreign Correspondence) ; Councillors, (resident) : J. Ackery, A. Underwood, H. Rose, C. D. Davis, C. E. Truman, W. R. Humby, W. B. Paterson, H. Baldwin, J. Gartley ; (non-resident), H. C. Quinby (Liverpool), D. W. Amoore (St. Leonard's), Wilson Hogue (Bournemouth), G. G. Campion (Manchester), J. McKno Ackland (Exeter), J. H. McCall (Leicester), T. Arkövy (Budapest), A. W. W. Baker (Dublin), F. E. Huxley (Birmingham).

The President then delivered his Valedictory Address.

THE PRESIDENT'S VALEDICTORY ADDRESS.

It is usual for the President at the close of the session to give a short valedictory address, which on this occasion, owing to more vital business having brought us to a late hour of the night, must be a very short one indeed. The valedictory has, I find, been usually confined to a brief *resume* of the work done during the past twelve months, and I think I cannot do better than follow in the footsteps of my predecessors.

I am happy to say that 1893 has been a year on which we may look back with some degree of satisfaction. While the outside worlds of commerce and politics have been surrounded by gloom and marked by disappointed hopes, the bright expectations with which we entered upon the past session have been amply fulfilled.

The record of our transactions shows that we have been full of life and activity; that not only have our members been ready to place before us, and through us before the profession at large, their wisdom and experience in the form of casual communications, as to many minor, yet helpful inventions, improvements, cases and incidents in practice, but they have also contributed largely in original and carefully-constructed papers, the results of painstaking and long-continued observation and scientific research.

At the February meeting we made a promising beginning with a lucid and instructive paper on "The Medical Aspect of Remote Pain in Dental Diseases."

At the March meeting the Secretary, in the absence of the author, read a paper by G. W. Watson on "The Pathological Condition of the Dental Pulp."

The following meeting was devoted to casual communications, when some very practical and useful ideas were brought under the notice of the Society by Messrs. R. H. Woodhouse, Redman, Coffin, Mansbridge and Humby.

The month of May meeting was principally taken up with an exhibition by Mr. Howard Mummery of Dr. Carl Röse's models, prepared from microscopic sections, of developing teeth in the human fœtus, and an explanation of his views with regard to the origin of the permanent teeth, from the original tooth-germ band rather than from the neck of the enamel organ of the temporary tooth.

The June sederunt was almost wholly and profitably taken up by an exhaustive discussion on "Empyema of the Antrum." The subject was introduced by Mr. Ackland and taken part in by many of the members.

In November we had a capital paper by Mr. Hopewell Smith on "The Cellular Elements of the Dental Pulp," profusely illustrated with noteworthy photo-micrographs.

In December we had a most interesting paper by Dr. Pickering, giving the results of a long-continued and elaborate series of experiments on "The Physiological Action of Chloroform on the Fœtal Heart," and we have now brought our session to a satisfactory termination with a paper by Mr.

Mummery, in which he has given us a clear exposition and temperate criticism of the views recently promulgated by Dr. Vicentini of Italy, who claims to have traced the origin of mouth bacteria to a common organism having true productive organs and an elaborate method of fructification.

This announcement must be received with caution. The existence of this organism has yet to be verified, and the subject is at present engaging the attention of Mr. Mummery, in London, and Prof. Miller, in Berlin.

Several important changes have been made in the bye-laws of the Association, and these will, I have no doubt, tend to minimise labour in conducting the business of the Society, as well as extend its usefulness.

The one which has been sanctioned to-night I need not make any special illusion to, further than to express the hope that it will induce an ever-increasing proportion of our non-resident members to come to the annual meeting and take an active interest in the administration of its affairs. I would further call your special attention to another alteration which ought to tend to the commonweal. I refer to the great facility which is now afforded to dental students and visitors from all over the kingdom for observation and study in the rich and extensive Library and Museum of the Odontological Society, placed at their disposal for reference on three evenings of the week.

This is a movement in the right direction, and is imbued with the catholic spirit which should control the actions of all scientific and professional societies.

In the month of July, I, along with Mr. Campbell, of Dundee, and Mr. Brownlie, of Glasgow, attended the annual congress of the Institute of Public Health at Edinburgh as your delegates, but as the congress officials have not yet reached an enlightened appreciation of the importance of Odontology, I am sorry to say that our presence tended more to the replenishment of that body's treasury than to the elucidation of matters connected with Dental Hygiene.

With regard to the numerical strength of the Society during the past year, I regret to say that we have lost five members by death, six by resignation, and one by removal from the list.

Our roll of new members for the year is, however, an encouraging one; twenty-five have entered, and one ordinary member, Mr. Imrie, has been transferred to the honorary list, and in addition you have heard this evening that there are twenty-six names in nomination for ballot at the March meeting.

It now only lies with me, gentlemen, as your President, to bid you goodbye, and in doing so permit me to thank you for your sympathy and your forbearance with me in my shortcomings and my absences, for which latter I can only plead distance as my excuse.

I have striven to do my best by you without sacrificing the interests of my clients at home, and perhaps you will allow that I have not been altogether neglectful of the honour and interests which you placed in my charge last January, when I remind you that out of eight meetings I have attended five, and to accomplish this I have travelled four thousand miles.

Permit me further to acknowledge the deep obligation I lie under to the Council and to the Vice-President who discharged my duties during my absence, and to the two Secretaries who week by week and month by month kept me posted in all the work of the Council and the general business affecting the welfare of the Society, I would tend my personal as well as my presidential thanks.

You have elected as my successor a gentleman who has not only the ability and the time, but who has that without which these two were worthless, the desire and *perfervidum ingenium* to carry him bravely through the protracted session which the alteration in the date of our annual meeting imposes upon your newly-elected office bearers. To him I would say from my heart's core, Fare you well, while I tender to you my official Good-bye.

Mr. David Hepburn, in proposing a vote of thanks to the President for his address and services to the Society, paid special tribute to Mr. Macleod's tact and wisdom, and reminded the members of his prominent position in the North, where his unbounded energy was ever to the fore in every great reform.

Mr. Mummery seconded the vote of thanks, which was carried with acclamation.

The President in reply, said his services were not due to any special ability, but rather to a desire to benefit his fellow-men, and especially the Society over which it had given him singular pleasure to preside.

A vote of thanks to the officers of the Society was proposed by Mr. Woodruff, and suitably acknowledged by Mr. Maggs.

The President tendered the thanks of the meeting to those who had brought forward casual communications.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The Annual General Meeting of the Society was held on Friday, January 12th, 1894. William Rushton, Esq., President, in the chair.

The minutes of the previous Annual General Meeting were read and confirmed.

Mr. Wheeler, Mr. C. Fox, and Miss Halliday were unanimously elected members of the Society.

The election of officers for the ensuing year then took place.

The Council proposed as President, Charles W. Glassington, Esq. This nomination was carried unanimously.

The Vice-Presidents were then announced, viz.: William Rushton, Esq., W. R. Humby, Esq.

A ballot having been taken, the following were declared elected as members of the Council:—

Past Students:—Messrs. A. Prager, H. B. Rowe, J. W. Smith.

Present Students:—Messrs. R. S. Nicholls, N. Reeve, A. C. Bradshaw.

Secretary to the Society—Mr. H. W. Tice.

Secretary and Treasurer to the Council—Mr. J. S. MacFarlane.

Librarian and Curator—Mr. T. G. Jenkin.

Casual Communications.

Mr. E. G. Carter presented two models showing retarded eruption of permanent teeth. One case showing a second lower bicuspid just appearing in an otherwise edentulous lower jaw, the patient being 60 years of age; the other showing a lower canine partially erupted in the centre of the lower jaw, in front of the incisor teeth, the tooth had remained stationary for four years. The patient was 46 years old.

Mr. Carter had recently extracted several teeth and stumps in the first case, in preparation for an artificial denture.

Mr. Faro presented a lower wisdom tooth, with the root curving backwards at right angles, this he extracted with the elevator, thus practically illustrating the advantages of the elevator in these cases, as if he had attempted to remove the tooth with forceps, the root would most probably have been fractured.

Mr. Bradshaw presented a second right lower molar, the pulp of which was completely calcified, the patient had had a good deal of neuralgic pain for about four or five weeks.

Mr. Bradshaw also presented to the Society one of the earliest forms of automatic mallet. A trigger compressing a spring, was pulled back by the forefinger, which on being released gave the blow.

Mr. Humby said that he thought it was originally the idea of Sir John Tomes.

Mr. H. Rose passed round a specimen of his latest production in continuous gum work. The president said he thought that the appearance was all that could be desired and asked Mr. Rose whether he did not find the weight of the case a disadvantage and whether it was not possible to make them lighter.

Mr. Rose in reply stated that they could not be made lighter and that in his experience the weight of a case was of no detriment to its suction, and cited a number of experiments in which cases made in various materials had been worn by a blindfolded patient, who was unable to detect the difference between the lighter and heavier cases.

Mr. S. Spokes in reference to cases of retarded eruption, mentioned a case which occurred in the practice of Mr. Beadnell Gill. A lady aged 83, had to have her plates cut away to allow for the lower wisdom teeth which were just making their appearance, and for a supernumery tooth in the upper, in the position of the left upper central.

Mr. T. G. Read recalled a case he had seen at Leicester Square, the patient erupted 2 upper wisdom teeth at the age of 83, and had never worn an artificial denture.

The President then gave a short valedictory address in which he touched upon the work of the Society during the past year. The general average of merit in the papers and casual communications of past and present students had been fully maintained, in addition to which the Society had had the advantage of a paper by Mr. Roughton on "Bacteria of the Mouth," (illustrated by means of his slides shewn in Mr. Cosen's lantern) and also a paper by Dr. Hill, on "The Nose and Throat with reference to dental and oral affections."

Their installation in the new hospital marked a very important step in the progress of the Society. They now had spacious rooms and every accommodation for their meetings, which would no doubt greatly increase in numbers.

Another pleasing feature in connection with the Society was that four members presented themselves at the last examination for the L.D.S. diploma, and all the four were transformed by that examination into "past students" of the Society.

In conclusion the President begged to thank the officers of the Society, especially the Hon. Secretaries for the loyal support and assistance they had rendered during his term of office.

The last ordinary meeting of the above Society was held on Friday, February 2nd, at 8 o'clock. C. W. Glassington, Esq., President, in the chair.

The minutes of the previous meeting were read by the Hon. Sec., and confirmed.

The following gentlemen were proposed for election as members of the Society:—Messrs. Everett and Hill.

Casual Communications.

Mr. Burroughs brought forward three cases which had come under his notice.

1. A little girl aged 6½, who came to the Hospital a fortnight ago, complaining of facial paralysis on the right side. She had been to the Richmond Infirmary, and the doctor at that Institution advised her to come to the National Dental Hospital, and have all her teeth out on that side. Whether or no they might presume that his opinion was, that the paralysis was due to a dental cause he could not say. Her *history*

was briefly this :—At the age of four she had whooping cough, followed by a discharge from the right ear, which soon disappeared. Two months after the whooping cough ceased, facial paralysis on the right side came on. The right eye was was then noticed to be weak, and on further examination it was found that the external rectus muscle which turns the eye outwards did not act, in other words that there was internal strabismus. Shortly after the paralysis began, a swelling appeared under the right lower jaw, extending from the angle to the mental foramen. This was diagnosed as mumps, and treated successfully by the doctor who attended her. About a year ago she had an attack of measles, and this was followed by pneumonia. For some months she has been unable to walk properly, and this difficulty has been gradually getting worse. At present the gait is unsteady, as that of a patient who was afraid to put the right foot to the ground, and she moreover walks rather widely. There is complete facial paralysis on the right side, as is shown by her laughing on the left side only, the right cheek hanging flabby, the right eye cannot be closed, and there is epiphora which he need hardly say was the escape of tears over the cheek owing to dropping of the lower lid. She cannot move the right eye outwards, thus showing paralysis of the external rectus which is supplied by the sixth nerve. She is almost blind in the right eye, showing paralysis of the optic nerve. There is also some weakness of the external rectus of the left eye, but in other respects this eye is normal. She is stone deaf in the right ear, and this indicates paralysis of the auditory nerve. The teeth on the right side are quite healthy, but on the left side there were two little cavities, which he had had filled with osteo.

Mr. Roughton who had seen the case, is of opinion that there is a lesion of the middle lobe of the cerebellum. This would account for the peculiar gait. As to the cause of the other paralysis it is difficult to localize the seat and the nature of each, but the acute inflammation of the middle ear, following on the whooping cough, might have lapsed into a chronic inflammation, and this might have damaged the facial and the auditory as they lie in the petrous portion of the temporal bone. The paralysis of the sixth nerve points to the lesion in the cerebellum, or in the petrous portion of the temporal affecting the sixth nerve in its transit from the medulla to the sphenoidal fissure.

2. A boy aged 11, who came to the Hospital on Dec. 14th, 1893, complaining of a swelling on the left side of the lower jaw. The swelling was first noticed nine months before, but as it was quite painless the patient did not trouble about it. However, as it increased in size, he thought it advisable to come to the Hospital. All the permanent teeth on the left side which ought to be present, were so, and were all quite healthy. Just behind the 6-year molar was the situation of the tumour. It was situated between the two plates of bone, and was perfectly hard, no trace of fluctuation being detected.

Mr. Roughton who saw the case, decided to perform an exploratory operation, suspecting sarcoma. When he cut into it, a collection of clear fluid escaped, and on further examination a tooth was found embedded in the floor of the sac. He removed the sac and its contents. On breaking down the bony walls of the dentigerous cyst, for that was what it was found to be, they were so very hard that the jaw was fractured. However, the case went on very well, and the cure was rapid and very satisfactory.

3. A woman aged 35, who came to the Hospital complaining of a swelling on the hard palate. The history was that eight years ago she had a swelling there, and her doctor advised her to poultice it. She did so, and there was some purulent discharge, which very soon stopped, and the wound healed up. Soon after, the swelling appeared again, and increased in size slowly, now extending from the inter-maxillary bone almost to the soft palate. Mr. Roughton, who has seen the case, is of opinion that it is a case of osteoplastic periostitis of the superior maxilla.

Mr. J. T. Fripp showed models of two cases he had regulated. (1) A case of great protrusion of the upper incisors, and the lower jaw being unnaturally short, the patient, a boy aged 13, had a very peculiar appearance. The plate used was made of D.A. gold plated, with wings extending round the buccal surface on each side. A cap of plate had been struck up over the faces and cutting edges of the centrals, and this plate was attached to the wings by means of India rubber bands. The attachments on the wings being placed as high as possible a slight upward pressure was exerted, and thus prevented the usual elongation that generally results ; in fact if anything the teeth were a trifle shorter.

The 2nd case, also a case of protrusion, Mr. Fripp had regulated by cementing gold bands round the molars and fastening the India rubber bands to an attachment on these. Mr. Fripp next brought forward a tray for taking impressions of the upper jaw. It was cupped gradually from the centrals to the wisdoms, and certainly seemed a great improvement on those already in use.

The PRESIDENT in thanking Mr. Fripp for showing the tray, said that he generally took an impression with an ordinary tray at the first visit of the patient, and then made a special one for each case.

Mr. FRIPP also presented to the museum a very good specimen of a 4-rooted upper molar that he had extracted.

Mr. T. G. READ had a very interesting case of absorption in the buccal roots of an upper molar. In treating the roots he found, on introducing a fine barb up the canals, the patient complained of great pain. He thought at first there might be a particle of pulp still alive, but on carefully feeling about, came to the conclusion that the pain was due to a short root and the barb passing through the apex ; this diagnosis was supported by the similar condition in an upper lateral which Mr. Read had extracted for the same patient. The molar was extracted, and the root found absorbed as anticipated.

Dr. Maughan showed a Salivary Calculus which he had recently removed from a young man aged 20. It was shaped somewhat like a torpedo and rough on the surface. It measured 1⅛ inches in length and ⅜ inch across at its thickest part and it weighed 21 grains. It was found lying almost horizontally on the left side of the frænum, about ⅛ inch protruding anteriorly through the opening of Wharton's duct. Probably it thus occupied the termination of the left Wharton's duct and one of the sublingual ducts on the same side. It is a common thing for one if not more of the sublingual ducts to open into the Whartonian or submaxillary duct. The operation was a simple one ; the patient was chloroformed, a director passed alongside the calculus for about ¾ inch and the canal gently stretched. The director was then withdrawn and with the forefinger on each side the stone was easily induced to leave its bed.

The symptoms that such a calculus as this usually gives rise to are difficulty in deglutition and articulation. He certainly pronounced his linguals thickly, but his powers of deglutition were unimpaired if one may judge of the amount of alcohol he imbibed daily.

A salivary calculus may be mistaken for Ranula, Dermoid

Cyst, Sebaceous Cyst, Necrosis of Jaw or Cancer. Dr. Maughan briefly indicated the diagnostic points in these affections.

The composition of Salivary Calculi is mainly made up of phosphates and carbonate of lime, magnesia, and soda. Often the size of a hempseed and removable with the fingernail, Mr. Bryant recommends a small incision for the larger stones. A Californian doctor reports a case where he removed a salivary calculus weighing 18 drachms!

The pathology is somewhat obscure.

It has been alleged that masses of bacteria or a foreign body or bodies get lodged in Wharton's duct and the inorganic constituents of saliva crystallize around them. Another theory is that the quality of the secretion alters and the inorganic salts instead of being ·188 per cent are more abundant with the result that crystallization easily occurs.

Dr. Maughan offered the specimen to the museum and it was accepted.

Mr. Glassington brought forward models of a patient aged 66 showing well marked attrition of the teeth in both jaws The incisors in particular were very much worn.

Mr. Glassington then delivered his Presidential Address.

INTRODUCTORY ADDRESS.

Gentlemen,—May I first thank you for the honour you have conferred on me, by electing me, for the second time, President of this Society. Mr. Rose, Mr. Humby, and our old friend, Dr. Gaddes, in addition to myself, have been likewise honoured, and as our Society has always flourished, whether a new or an old President has been in the chair, I trust this session will be no exception to the rule. It has always been our custom for the incoming President to give an introductory as well as a valedictory address. By Rule 17, he (the President) is bound to inflict the members with the latter, but why the former has become a recognised affair, I know not. I think it a great mistake, and finding I was not infringing any rule, I tried my best to get somebody to read an interesting paper this evening, on which a discussion might follow, but they all "with one accord began to make excuse," therefore, gentlemen, you will have to put up with my humble oratory.

I am strongly of opinion that the introductory speech should consist of a few words of thanks, and that the rest of the evening be devoted to some subject which would be of benefit to the members. First of all I shall tell you what the Society intends doing during the present session.

At our Council Meeting this evening, we have drawn up a very good programme. Papers have been promised for every meeting, the majority of which, (as I think should be the case) will be read by present students. I do not mean by this that old students are prohibited from reading papers, but I take it that one of the main objects of this Society is to draw out the hidden talents of the coming generation of dentists. Those of us who are in practice, and are more or less earning our daily bread (not to say cheese) in a very comfortable manner, are quite willing to sit and look on, or I should say, listen, to the ideas of the dentist of thefuture, and may I add (of course *sotto voce*) perhaps gain some grand idea which his younger brain has hit upon. The old or past student is, however, equally entitled to read a paper if he will only come forward, but this year they seem either too diffident or too busy. Therefore, as I said before, the majority of our papers will be read by the present students, but in addition, our friend and past president, Mr. Rose, will in the May meeting read a paper on "Mineral Inlays." This I need scarcely say, will be of interest to us all, and of great practical use to both past and present students. At our next meeting in March, Mr. W. G. Spencer (the Dean of Westminster Hospital Medical School), has promised a paper on the Temporo-Maxillary,—I beg pardon,—I mean the "mandibular" Articulation, which should cause a good attendance and discussion. We have also discussed the matter of a Conversazione, to be held in the hospital. We have plenty of rooms here, and I think a very pleasant evening might be spent. Whether it will only be of a dental nature, or whether we shall combine it with some form of lighter entertainment such as music and singing, and invite ladies, has yet to be decided. In either case, we (the Council), shall want plenty of help, and I have suggested that a committee should at once be formed to carry out all arrangements. Those of you who were present at our Annual Dinner will remember the remarks of Mr. S. J. Hutchinson on the formation of an Athletic Club. I am afraid whether we are strong enough in numbers at present to do this, but we intend trying to form a Tennis Club, which bids fair to be a success if we can only find suitable ground. For those who are lovers of harmony, I may here state that a Sub-Committee has been selected to carry out arrangements for a Smoking Concert, full particulars of which will be shortly announced

This, gentlemen, is the "Menu" we (the Council) have to put before you for the forthcoming session. By the way, speaking of Smoking Concerts reminds me of a subject I was nearly forgetting. Several members have asked me to suggest that smoking be allowed at all our meetings, and have argued it will bring an increased attendance. Personally speaking, I would say, by all means "smoke," but, gentlemen, I would remind you that at all the meetings of the various Medical and Dental Societies, of which we are embryos smoking is *not allowed.* It rests with you to decide whether we are to go out of the beaten path, and strike out in a rule of our own. There is no rule in our Society which forbids smoking at our meetings, nor, may I point out, is there any rule which says that a member is not allowed to "toss for drinks," or play "shove ha'penny," still, we should be very much surprised if any member happened to start either of these—shall I say amusements ?—in the middle of a discussion. May I suggest to those lovers of the fragrant weed (fond as I am of its seductive properties) that we should follow the rules of our parent Dental Society (The Odontological).

I simply throw this out as a suggestion. Those who are in favour of smoking at our meetings, can petition the Council when it will receive full consideration.

I cannot let this opportunity pass without referring to our new Hospital, nor to the fact that this society will greatly benefit by our change of quarters, and that we are duly sensible of the handsome gift of the generous donor. In erecting this building the Dowager Lady Howard de Walden was not only doing a good act for the necessitous poor, but she was looking after the welfare and future education of Dental Students, in whom I know she takes great interest. We cannot over estimate the advantages of this gift. Of course in its present state the building is still incomplete, but in a short time when "the powers that be" can see their way clear, or perhaps I should say to speak plainly, have the necessary funds in hand, to enable them to carry out certain improvements and additions, our Hospital will be second to none. It would be out of place to draw any comparison between the new and the old building. In times gone by, crippled as we were for want of room and money, we did our level best to turn out good men. Up to a certain time, we could boast of never having had a student who had failed at any Dental Examination, and on more than one occasion at the L.D.S. Eng., examination, our percentage has been 100. This goes to prove we have done good work in the past; now with our new Hospital we must at least do as good, but I think you will all agree with me when I say it will be a great deal better. In my opinion a Hospital and School should derive a large amount of support from its old students, and will you allow me to point out how old students can help their Alma Mater. Well, first of all, by subscribing to the funds of the Hospital, if they are rich enough to do so; secondly, by persuading any affluent friend or relative to do the same; thirdly, by sending impecunious patients to be treated at the Hospital; and lastly, but by no means least, by urging fresh students to join us. Gentlemen, we have plenty of material here to work upon, our great difficulty is to get men to do that necessary work. The more students, the greater will be our teaching finances. Need I say more?

Now, gentlemen, I will come back to our Society. I am afraid I have been talking too much about the hospital, but to me they are one and the same thing. It would seem like parting with a relative or a dear friend, if I severed my connection with this Institution, and whenever I have had an opportunity of doing any good to it in any way, I have always done so.

Speaking of finances reminds me the Society starts this year with a good balance in hand. We purpose with part of this, adding to our Library, by purchasing some of the latest editions of Dental, Medical, and Surgical literature.

Now, gentlemen, I have finished. I must thank you for having listened so patiently to my lengthy speech, with which you would not have been inflicted, had some friend kindly stepped into the breach, but having listened to it, I can only say, to quote the Immortal bard, "God give you quiet rest to-night."

Mr. P. Greetham proposed a vote of thanks to the Presiden for his very able address, and expressed his pleasure at seeing him occupying this position for the second time.

Mr. Fripp seconded the vote of thanks which was very heartily carried.

LIVERPOOL DENTAL STUDENTS' SOCIETY.

The monthly Meeting of the above Society was held on Friday, January 21st, Mr. E. J. M. Phillips in the chair. Mr. Woods shewed three specimens of three rooted lower molars, the posterior root in each case being bifurcated.

Mr. Rose exhibited a collection of old ivory block work, 18 pieces in all, which he explained were mostly the work of his father and grandfather. Some of the cases were examples of beautiful workmanship, and fine specimens of a class of bench work now obsolete.

The President called on Mr. J. A. Woods for his paper on "Alveolar Abscess," which we publish on page 202.

Mr. Byrne asked whether Mr. Woods considered necrosis of a tooth was possible. He advocated amputation of the apex of the root in chronic alveolar abscess. He did not consider carbolic acid the best drug to use in suppurating root canals.

Mr. Bates said it was his custom to practise conservative treatment in all cases, and advised members of the Society to do likewise, as he had found that a surprising proportion of chronic cases could be successfully treated. He did not believe in the efficacy of root amputation. He found the best results from the use of iodoform as a root dressing.

Mr. Royston thought that Mr. Woods had derived his facts from old authors. He had noticed that lower incisor teeth very frequently abscessed, and that the constitutional symptoms of alveolar abscess very much exceeded in severity those of any other form of abscess. He did not believe that the apex of a tooth could necrose. For root-dressings he advised the use of creolin, a new antiseptic, which he considered smelled even worse than iodoform. He did not approve of the method of pumping medicaments through a root canal practised by Mr. Woods.

Mr. PARSONS had observed a marked tendency to alveolar abscess in anæmic subjects. He quite believed that necrosis of the apex of a root was possible.

Mr. OSBORN said there was no such thing as necrosis of a tooth. He considered that the so-called necrosis of a tooth was simply absorption. He had successfully treated alveolar abscess with peroxide of hydrogen. After making a sinus over an abscessed root, he used a piece of silk as an irritant to keep it open.

Mr. ROSE was glad that Mr. Woods, while reading the new theories, did not neglect the old authors. He considered there was not the least doubt that necrosis of a root did take place, though, for anatomical reasons, a sequestrum could not be formed and thrown off.

Mr. EDWARDS emphasized the need of free drainage, and the use of antiseptics in root treatment. He said that the law of gravity required that incisions for drainage should be in the most dependent positions obtainable, in order to facilitate the escape of discharges. He quite believed that necrosis of a root took place.

Mr. PHILLIPS pointed out a true gum boil as being a small pustule formed in the oral mucous membrane, frequently just behind the upper central incisors. He used permanganate of potassium himself to pump up the roots of abscessed teeth. He fully believed in the occurrence of necrosis.

Messrs. Shields, Scholefield and Kaiser also spoke briefly.

After Mr. Woods had replied shortly, the meeting was adjourned with the customary vote of thanks.

EDINBURGH DENTAL STUDENTS' SOCIETY.

The third general meeting of the present session of this Society, was held on the evening of Monday, Jan. 15th, when Mr. G. W. Watson L.D.S. delivered an address on "Dental Diagnosis;" and at the following general meeting held on Feb. 5th, Mr. J. Austin Biggs L.D.S. brought before the members a number of interesting models, and cases in course of construction, illustrating his notes on "The Retention of Dentures in much absorbed and tender Lower Jaws."

The tenth Annual Dinner will be held in the Imperial Hotel on the evening of Thursday, March 8th.

Dental News.

OPENING OF THE NEW BUILDINGS OF THE NATIONAL DENTAL HOSPITAL.

His Royal Highness the Duke of York, who has become the President of this Institution, on Saturday formally opened the new Hospital recently erected at the corner of Great Portland and Devonshire Streets. It has been designed by Mr. A. Thompson, and built by Mr. Andrews, of Mount Street. The cost, amounting to nearly £10,000, was entirely borne by The Right Hon. Lucy Cavendish Scott, Lady Howard de Walden. H.R.H. arrived at noon, and was received by the Vice-President, Lord Strafford, and the Trustees. After Lady Howard de Walden and the Committee of Management had been presented, the Prince and his party were shown over the building by the Dean, Mr. Sidney Spokes. On reaching the Lecture Hall, where a company of several hundred friends of the Institution were seated, the Prince ascended a daïs, and the Bishop of London offered prayer. The Earl of Strafford, on behalf of the donor of the Hospital, the Dowager Lady Howard de Walden, and the other officers of the institution, tendered thanks to the Prince for allowing his name to be associated with the institution as its president, and for his attendance to inaugurate the new Hospital. He reminded his Royal Highness that for many years past dental surgery in this country had made great and rapid strides. Up to the year 1860, however, although dental surgery had formed a portion of the instruction at the great Metropolitan hospitals, there were no buildings specially adapted for the pursuit of that part of surgical science. In the year 1861 a small building in Great Portland Street was taken, and thousands of people had received benefit from the establishment of that Hospital. The premises were very narrow and cramped, and considering that a college of instruction with lecture rooms was highly necessary for the furtherance of the work of the institution, the management felt that the work in Great Portland Street was somewhat confined in its operations, and were very anxious for larger and more commodious premises. Those premises, thanks to the noble gift of the Dowager Lady Howard de Walden, they were that day in possession of (cheers). They now had every hope that the good work of the Hospital might be extended. No fewer than 27,902 persons had, during the past year, received relief by the surgical skill of the staff of the Hospital (cheers).

His Royal Highness replied as follows:—"It gives me much pleasure to attend here to-day, and to assist in the carrying on of such a useful Institution. Among the many hospitals engaged in charitable work for the poorer classes, I feel sure that the National Dental Hospital must afford an amount of relief in the particular kind of cases dealt with here, which some of us are apt to overlook. I am glad to learn from Lord Strafford of the good work done here ; and what ever may be the criticism sometimes passed upon the establishment of so-called "special" hospitals, I feel sure that Dental Hospitals cannot be open to objection. One peculiar feature is that the actual treatment of patients is mainly carried out, as a matter of routine, by students. I am informed that after a special preparatory stage, the student is entrusted with the charge of patients under the supervision of the Surgical Staff. At the close of the curriculum when the student presents himself at the Royal College of Surgeons for examination, he has probably performed all the operations he may expect to meet with during his professional career. Thus the patient and the student render mutual aid to each other, for the former has the advantage of receiving the benefit of skilled treatment.

" As President of the Hospital, it will give me satisfaction to know that the same good results are continued in the future.

" I must not omit to refer to the munificent action of the Dowager Lady Howard de Walden. It is due to her generous interest in the beneficial work carried on by this institution for the last thirty years, that we are able to meet in this handsome building to-day. I have had the opportunity of seeing the excellent arrangements now brought to completion, and I heartily trust that nothing may interfere with the successful attainment of the ends in view, namely, the alleviation of dental troubles amongst the suffering poor, and the education of a race of future dental surgeons who may do honour to the special branch of surgery to which they will belong. I have now much pleasure in declaring this New Building open for the useful purposes for which it has been erected."

His Royal Highness, who was loudly cheered, unveiled two tablets in the vestibule, on leaving the building. Of these, one refers to the gift of the hospital by Lady de Walden, the other to the opening by the Prince.

GOLDEN WEDDING OF SIR JOHN AND LADY TOMES.

At a meeting of members of the Odontological Societies and British Dental Association, subscribers to the testimonial fund, held at 40 Leicester Square on Feb. 3rd, Sir Edwin Saunders in the chair, a representative deputation was appointed to wait upon Sir John and Lady Tomes on the occasion of the 50th anniversary of their wedding day, for the purpose of presenting them with an illuminated address expressive of the honour and esteem in which they are held ;—an album containing the names and addresses of the subscribers to the Scholarship Fund established in commemoration of Sir John's valued services to his profession, and also containing the names of the ladies, wives and sisters of the members, who had contributed to the purchase of a golden inkstand as a special gift to Lady Tomes.

Accordingly on Feb. 14th St Valentine's Day, the deputation, consisting of the following gentlemen, met and journeyed to Upwood Gorse, Caterham, the residence of Sir John Tomes, viz :—Sir Edwin Saunders, Messrs. T. Arnold Rogers, S. J. Hutchinson, G. Brunton, G. A. Ibbetson, J. Smith Turner, F. Canton, Walter Campbell, W. F. Forsyth, J. H. Mummery A. J. Woodhouse, S. Lee Rymer, E. Trimmer, Secretary of the Royal College of Surgeons, England, W. H. Woodruff, W. B. Paterson. The following was the address :—

"We who have recorded our names on this book, tender our hearty congratulations to you, Sir John and Lady Tomes, upon the attainment of this, the 50th anniversary of your wedding day.

This event, though in some sense a private one, seems to afford an opportunity which we gladly seize, for expressing in a manner more personal than would be appropriate to any more public occasion, our recognition of your life-work and mutual devotion.

The singleness of purpose with which this object (nearest to the hearts of all of us) has been pursued, whether it be the scientific, the social, or the political advancement of our professional interests, has called forth this expression of regard and esteem, which it has been thought, could take no form more in accord with your well-known feelings, than that of a personal gift to your devoted helpmate, and the foundation of a scholarship (or Prize Essay) to be awarded triennially to members of our profession, for original work in any direction of scientific enquiry.

This it is hoped and believed, will commemorate in rising and future generations, the appreciation by us, your contemporaries, of your life work in the educational reform of your profession, and inspire in them something of the same spirit of high aspiration and self-denial, which has characterized your long and honourable career. We express our earnest hope that you may both be long spared to enjoy your well-earned rest, in the assurance of the warmest good wishes of your many friends." February 14th. 1894.

APPOINTMENT.

Mr. Bowman Fisher has been appointed Dental Surgeon to the Greenich Infirmary.

VACANCY.

The Victoria Dental Hospital, 16 Devonshire Street, All Saints, Manchester. The post of House Dental Surgeon is vacant. Application to be made to the secretary on or before 12th March.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the "British Journal of Dental Science."

Sir,—I beg to submit to you a case which, speaking with the diffidence expected from a layman, is, in my opinion, an example of professional misconduct, or it at any rate, constitutes a gross breach of professional etiquette. The circumstances are briefly as follows :—

A few weeks ago I called upon the leading dentist (an Anglo-American) of one of the principle cities of North Italy, and asked him to perform a certain operation on a patient living in the country some twenty miles distant, who was seriously ill, and unable to leave her residence. He agreed to undertake this, and the time of arrival, fees, etc., were definitely settled.

On the appointed day, the gentleman sent a telegram simply stating that he was unable to come, this was followed two days later by a curt letter, in which the only excuse or reason given for his non-arrival was, that " after consulting his books he preferred not to visit C," (the town near the patient's residence).

As this was the first time I had had any dealings with this gentleman I was not satisfied with this excuse, which certainly seemed a *non sequitur*, and wrote requesting an explanation. No reply was received to this or subsequent letters.

I should mention that the failure (intentional as was shown subsequently) on the part of this gentleman to keep his appointment not only caused a good deal of avoidable suffering to the patient, but seriously inconvenienced the doctor who had arranged to be present at the operation.

I am ignorant of the rules which govern the etiquette of members of the dental profession in their relation to their patients, but certainly in the medical profession, such conduct would be considered inexcusable.

I am, sir, yours faithfully,

E. A. REYNOLDS—BALL

(B. A. Oxon.)

Villa Osella, Carmagnola, Italy, Feb. 10th, 1894.

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SOME REMARKS ON THE USE OF ANÆSTHETICS IN DENTAL SURGERY.*

By Albert Maurice, L.D.S. Ed.

Mr. President and Gentlemen,—I do not think any apology is necessary for bringing the subject of anæsthetics before this society. In spite of the modern advances in methods of saving teeth we are still unfortunately obliged to extract a great many : more especially those among us whose practices include many of the less-educated classes, or who hold hospital appointments. Probably there is no operation in the whole domain of surgery more acutely painful during the happily-short space of time that it usually lasts than the extraction of a tooth ; and therefore it behoves every dentist to have at his command all available means of reducing this ordeal of pain to a minimum, or of abolishing it altogether. When we also have in mind that the administration of anæsthetics furnish the only occasions on which the dental practitioner may be said to hold his patients between life and death, it follows that it is our bounden duty to give every possible consideration to the whole question of anæsthetics and their administration, in order to accomplish the end we have in view with the least risk. We find, however, that with few exceptions dental surgeons take no pains to develop their knowledge of the physiology of anæsthesia. They are content in most cases to call in medical men and leave all responsibility to them. This is not quite as it should be. Without wishing to trespass on the ground occupied properly by medical men as anæsthetists, I think dentists, having to seek the aid of anæsthetics daily should endeavour thoroughly to understand their properties and manner of use for themselves, so that they may be able to lay down a systematic plan of the practice of anæsthesia in dental surgery.

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* Read before the Manchester Odontological Society.

There is no lack of literature on the subject of anæsthesia, not only in its relation to surgery generally, but also on its bearing towards the specialty of dentistry ; and there has been during the past thirty years an almost unceasing succession of papers and discussions on the subject ; but a reference to the current authorities will show that the facts that have been elicited and the deductions reached are only extant in a very scattered and desultory condition ; and that where easily accessible they seem to exist in too theoretical a form for the easy assimilation of the practitioner.

If, by making use of the observations, both in speeches and writings, of professional anæsthetists, and of the various commissions of experts that have from time to time investigated the phenomena of anæsthesia, we can interpret truthfully the results obtained in our own experience, we shall have travelled a considerable distance towards laying down a scientifically-based and easily-applicable rule of practice in dentistry ; and I think the opinions of members of this society, as I hope to hear them expressed this evening, will carry weight with the profession generally. In the presence of so many men of great experience, I can only offer my views as suggestions ; and I trust that at least they may give occasion for a mutually-profitable discussion.

In adopting a system of procedure in our practices, we ought to avoid the fatal error of working entirely on a basis of pure theory, and probably looking for phenomena which may never present themselves; or, on the other hand, of working by rule of thumb, and being unable to recognise the physiological reasons for unusual symptoms when they appear unexpectedly.

The first point we generally have to decide is when to use an anæsthetic and when to operate without one. I venture to ask the concurrence of the members of this society in the views I have formed on this subject. I am of opinion that an anæsthetic, either general or local, is indicated in all cases of tooth extraction, (1) in which the patient is possessed of a dread of the operation which can be dispelled by an assurance of immunity from pain; (2) in which the infliction of pain and the shock of the operation is likely to have a prejudicial effect on the patient's health; or (3) in which the pain is likely to be so badly borne as to discourage the patient from allowing us to complete the necessary operations,or series of operations.

The advisability of using an anæsthetic being decided upon, we have next to establish in our minds some canons, or points of guidance, as to the most suitable one to employ in any given case. As regards the choice of an anæsthetic, we find that their number is legion; some drugs being used only in special department of surgery, or under exceptional conditions, and many others only figuring in the text-books as reminders to the curious of their having been experimented with and discarded. For our purpose which is above all a practical one we need only at present concern ourselves with chloroform, ether, nitrous oxide, and pental, as general anæsthetics, and ether spray, ethyl chloride, and cocaine as local anæsthetics; and I may here express an opinion that several even in this list will not be found to occupy much of our time in profitable consideration. To the general surgeon the choice of an anæsthetic presents a more complicated question than it need usually present to the dental practitioner, as the former has to consider the comparative suitability of the various available anæsthetics to the particular operation he has in view, as well as the fitness of the particular patient to bear the administration of it without undue risk or discomfort. As, however, nearly all our operations are of one character, it should, I think, be the question of the patient's safety which should first engage our attention, as it may in many cases be possible for us to bring our skill to bear so as to operate successfully under somewhat more difficult conditions than we should experience if we had to operate under the anæsthetic which we deem the most convenient to ourselves.

The average dental operation being of short duration there can be no doubt that nitrous oxide is the most suitable anæstic to administer. The ease with which it is exhibited, the absence of taste or smell, the constancy of the results obtained, the quick recovery, and the almost entire absence of risk, stamp it beyond all question as the typical anæsthetic in most operations which can be completed in thirty or forty seconds.

When more has to be done than can be successfully carried out in the time named, we have to choose between giving nitrous oxide two or more times in succession, or using an anæsthetic the effect of which can be maintained for a longer period, sufficient to finish the whole operation on one occasion. Some practitioners adopt one of these plans, some the other. Bearing in mind the conveniences and advantages of nitrous oxide as just enumerated, the former course will be the one indicated in most cases, but there are many cases in which we are obliged to adopt the other. Putting aside the cases of patients who have to travel long distances to see us, and whose opportunities of doing so frequently are limited, but to whose personal convenience we often have to adapt our methods of practice, we must remember that patients undergoing a series of operations at intervals of days or weeks, exhibit often a deterioriation of nervous power which results in them taking nitrous oxide less and less well on each successive occasion, this being manifested by restlessness while inhaling the gas, a shorter period of anæsthesia, and unpleasant dreams while under its influence. In these cases we may regret we did not undertake the whole operation on the first occasion. That this deterioriation in the power of taking the anæsthetic well several times in succession really exists, I hardly think will be disputed, and I consider it a most interesting point, and one deserving our investigation. My own experience is that patients take nitrous oxide better on the second occasion than on the first, and this I attribute to the fact that on the first occasion there is a fear of the unknown, while on the second occasion they are prepared to undergo what they have by that time discovered is not really an ordeal that need be dreaded. After the second administration, however, I have again and again noticed a fear of the operation, which is worse at the fourth than at the third administration. I am not able to assign any direct reason for this, and should like to hear whether the experience of other practitioners corresponds with mine in this respect. Until we succeed in discovering the reason for this nervous collapse and the way to remove it we must not forget to show the greatest kindness and sympathy to those of our patients who are so very unfortunately affected, instead of blaming them for exhibiting weakness.

Be the cause what it may, we are in many instances driven to operate under chloroform or ether, and one of my principal objects in writing this paper is to try and influence all dentists who may hear or read it to discourage the use of chloroform in favour of ether in every possible case.

For many years chloroform has been the routine anæsthetic in the United Kingdom, and even now is almost invariably used in Scotland. The London medical schools, as pioneers of the coming revolution in the induction of anæsthesia, are in many cases teaching the administration of ether ; but, as long as Scotland continues to supply us annually with a large proportion of our medical men, and as long as the older English-taught practitioners of medicine continue to practise in provincial towns where there are no special anæsthetists, pressure will continue to be put on us to perform our longer operations under chloroform. As dentists we can do much for the relief of human suffering and the prolongation of life ; but I do not think we can do any better work than to set our faces resolutely against the administration of chloroform to our patients. Combined action on our part in this direction will do much to hasten the abandonment of chloroform except in the very few cases in which it is specially indicated. Our title to take the lead in this crusade may rest on the fact that out of 176 deaths under chloroform during the performance of different operations reported upon by the *Lancet* Commission in the issue for March 25th, 1893, no less than 18, or over ten per cent.,occurred during operations for the extraction of teeth. This unduly high percentage might certainly have been lessened by a more proper appreciation of the physiology of anæsthesia, and of the importance of shock as a factor in tooth-extraction. The risks in giving chloroform in tooth-extraction are greatly increased by the practice of many inexperienced anæsthetists of administering it to patients in a sitting, instead of a recumbent, position, in order to meet what they imagine to be the convenience of the dentist, and of treating the operation as one of so little importance that what is often called a " whiff of chloroform " is sufficient to annul pain. So it no doubt is, but it greatly increases the risk of death from cardiac failure. I have heard of a hospital where it was not long ago the custom to administer chloroform to the dental patients in the horizontal position, and the moment the patient was ready for the operation to swing the chair suddenly into the perpendicular. Such a course can only be adequately described as little short of murderous. A medical gentleman who has on several occasions administered ether to patients for me expresses the opinion that the time is not far distant when coroners' juries will return verdicts of manslaughter against the anæsthetists in all cases of death under chloroform.

We should always have in mind in discussing anæsthetics that their physiological action differs, and in what the difference consists. Chloroform and ether although occupying utterly different positions chemically are, nevertheless, closely allied in the phenomena they induce when inhaled ; the points of similarity being much more striking and well marked than are those of difference. It is just as important for the operator as for the anæsthetist to be able to read and interpret the symptoms exhibited during anæsthesia. It is just as dangerous to commence an operation, however slight, before anæsthesia is complete as to push the anæsthetic too far. Under chloroform, which, as it has been hitherto the most largely used, we may call the typical anæsthetic, there are generally said to be three stages. First, the stage of Excitement,in which the cerebral centres, the muscular centres, and the circulatory and respiratory centres in the medulla, are stimulated in the order named, giving rise respectively to quickening of the senses and imagination, to struggling, and to acceleration of the pulse and breathing. Second, the stage of Depression, in which the centres are successively depressed in the same order, giving rise to loss of consciousness and special sense, abolition of reflexes, commencing with the patellar reflex, followed by those of the skin, then of the conjunctiva, and lastly of the nose, relaxation and paralysis of muscles, and slowing of the pulse and breathing. The close of the second stage denotes the anæsthetic condition, and is the time to operate. In the first stage the pupils are dilated, in the second contracted, and their dilation a second time on the anæsthetic being pushed denotes that the patient has entered the third stage which is always one of Danger. In ether the phenomena are mainly similar, but the excitement stage is longer, and the anæsthesia produced is shorter and less profound. The depression caused is also less. As regards the strength in which these two drugs may be administered, it should be said that while chloroform should only be administered in the proportion of 3 or 4 per cent. to 97 or 96 per cent. of air, as much as 70 per cent. of ether vapour may be administered to 30 per cent. of air. In fact, ether inhaled in this concentrated form gives rise to less struggling at the time and less distress afterwards than when given more diluted with air. Both these anæsthetics are seen, therefore, to produce their effect by action on the nervous system. This has also been proved by applying chloroform direct to the brains of animals without it passing through the blood, when the same effects are produced as when inhaled into the lungs and conveyed by the circulation to the brain.

The action of nitrous oxide differs from that of chloroform or ether. Until recently it was denied by some authorities to be an anæsthetic at all, being said by them to be a pure and simple asphyxiant. More recent researches and experiments of M. Paul Bert in France, and Dr. Hewitt in England, by administering nitrous oxide in conjunction with a small proportion of oxygen have finally set at rest this delusion. It has no doubt a specific action on the nervous system, giving rise to *bona fide* anæsthetic effects, which is exerted in the presence of oxygen as well as when oxygen is excluded ; but I am inclined to think the condition into which most dental patients are placed by the aid of this gas is one into which asphyxia largely enters. Even if this be the case, it does not affect the great safety of nitrous oxide over any other known anæsthetic. While the recorded fatalities under ether, chloroform, and their compounds nnmber hundreds annually, we can only find record of ten cases of death while under the influence of nitrous oxide or shortly after its administration which can by any logical process of reasoning be attributed to the anæsthetic. When we remember that nitrous oxide has been administered infinitely more times than every other anæsthetic, in a large proportion of cases by utterly uneducated and unskilled dentists, and to patients in no way prepared for an anæsthetic, we may without undue over-confidence rejoice in the possession of an agent the use of which under circumstances of reasonable care is as absolutely reliable as that of any drug can be.

Contrast with this almost complete immunity from fatal results in all the years during which nitrous oxide has been administered the high proportion of deaths under ether and chloroform, the latter reaching figures that should make us seriously reflect. Dr. Julliard of Geneva has collected statistics which show one death to every 3,258 administrations of chloroform and one death to every 14,987 of ether. Dr. Ormsby of Dublin produces somewhat different results, being more favourable to ether and less so to chloroform. He finds the proportion of deaths to administrations to be one to 2,873 of chloroform, and one to 23,204 of ether. A combination of these two sets of figures show the fatalities under chloroform to be five times as frequent relatively to the number of administrations as under ether. The *Lancet* Chloroform Commission last year, reports a much more alarming proportion still, showing deaths under chloroform to have been thirteen times as frequent as under ether, allowance being of course made for the vastly larger number of cases in which it has been administered. It is only fair to mention in this connection that Surgeon-Lieutenant-Colonel Lawrie reports forty-five thousand cases of chloroform without a single death Here no doubt climatic conditions contribute to the happy result. All his cases were in India, and the previously quoted statistics were European, with the exception of some collected by the *Lancet* commission in the United States. But as our practice lies in Europe it is with European statistics and averages that we must concern ourselves.

As I have said, all my opinions are in favour of the use of ether instead of chloroform in all possible dental operations, that for any reason cannot be completed under nitrous oxide. The greatest difficulty we now have to contend against is the number of medical practitioners who prefer giving chloroform because they do not know how to give ether. I hope that by dentists using their influence in favour of ether we shall soon arrive at a condition of things in which all medical men will be able and ready to administer it for us.

Nitrous oxide should be given through an inhaler which has two valves in the stopcock, an inspiratory and expiratory for the passage of the gas. Dr. Hewitt advocates the addition of an extra respiratory valve for air, so that the patient becoming accustomed to breathing air through valves before the gas is turned on does not notice the change from air to gas; but I have found that if the gas is turned on carefully and without the bag being too full the patient is not inconvenienced by the change, and we have the advantage of the extra simplicity of mechanism in having one valve the less. The inhaler I use is so arranged that at the proper stage in the administration the inspiratory valve can be dispensed with and the expiratory opening closed altogether so that the patient can breathe the expired gas to and fro. I am aware that if this has any effect at all it must increase the asphyxiating action of the nitrous oxide, but if used within bounds I do not think it need be condemned on that account, and the advantage is that it generally gives a slightly longer period of anæsthesia. The argument of the possibility of infection from the bag is one that must be met ; but I do not see in what it differs from the case of the ether bag or even the face-piece used in giving any anæsthetic. I do not, however, advocate the use of this to and fro breathing, and only use it in cases where a slight prolongation of the anæsthetic may obviate the necessity for a second administration.

The best way to give ether is following nitrous oxide. The patient is in this way saved the disagreeable part of the administration of ether by being placed under the influence of the not unpleasant nitrous oxide before the otherwise irritating ether vapour is applied. The operator also is saved time, as by this method it is possible to anæsthetise a patient ready for the longest operation in three minutes. There are various ways of giving nitrous oxide followed by ether. The simplest is probably the best. Nitrous oxide is first exhibited in the usual way, the patient being watched until he has reached a stage of unconsciousness at which he will not be able to detect the presence of ether. The gas face-piece should then be exchanged for an Ormsby's inhaler charged with ether. This exchange must be effected at the moment between a full inspiration and the commencement of an expiration. The expired nitrous oxide will then pass over the sponge of ether to the bag, and will on the next inspiration be re-inhaled into the lungs heavily charged with ether vapour. It is most important that the bag be large enough to contain all the air of a full expiration. The ether inhaler should then be held close to the patient's face until he exhibits considerable cyanosis. This method is better than using a supplementary bag for ether connected with the nitrous oxide apparatus, as it avoids the necessity of giving subsequent patients nitrous oxide through a face-piece impregnated with ether.

The cases in which nitrous oxide should not be used, are those of very elderly patients, when there may be a great difficulty in re-establishing interrupted respiration. In these cases the addition of oxygen minimises the risks, which would on the other hand be dangerously increased by letting the patient become even more asphyxiated by to and fro breathing of the expired gas. Persons of great obesity who require air freely should not be placed under nitrous oxide undiluted with oxygen; and in very young children a difficulty is often experienced in persuading them to allow the inhaler to be held firmly enough to the face.

Ether is contra-indicated in bronchial or lung disease, in patients with aneurism, and in those suffering from atheromatous vessels. All these patients may be advised by their medical men to submit to the A.C.E. mixture as a safer anæsthetic than chloroform. It may be so, but it is certainly a much more disagreeable one. It should not, however, be thought that the A.C.E. is a safe anæsthetic in all cases. It is a mechanical mixture of alcohol, chloroform, and ether. If kept as a stock mixture, it rapidly alters its composition, owing to the different evaporating points of its constituents; and when mixed fresh should always be looked upon as a mixture of which chloroform is its most dangerous ingredient, and should, therefore, always be administered with the same caution as that with which we should use chloroform by itself. Possibly it is of some value for patients with diseased heart-valves, although these are the cases in which one might with confidence use chloroform, as being the anæsthetic agent most likely to take effect quietly and without much struggling. Nitrous oxide should not be administered during gestation later than the seventh month, as it excites too much muscular movement. Chloroform is said to cause contraction of the parturient uterus, and therefore Dr. Hewitt advises the use of A.C.E. followed by ether for such patients, if the operation cannot be postponed. If the ether causes coughing, recourse must then be had to chloroform. Lactation is said to be no bar to the employment of any anæsthetic desired.

The only general anæsthetic not yet mentioned, which may be said to be at the present day within the region of practical dental surgery is pental. This drug, or one almost identical with it, was used in a few cases fifty years ago, under the name of amylene; but was abandoned on account of the unreliability of the results obtained by its use. It has been re-introduced within the last two or three years, and the members of this society have had some opportunity of seeing its manner of use most ably exemplified. Already several deaths while under its influence have been recorded, showing it to be much less safe than nitrous oxide. It is also much more unpleasant. It will probably not be largely used, as the advantage of gaining about twenty seconds longer anæsthesia than with nitrous oxide is utterly insufficient to compensate for the drawbacks mentioned.

Before leaving the subject of general anæsthetics, a few words must be said as to the dangers likely to be met with in their administration. The most important one to look for is paralysis of respiration. Should this occur we have to discontinue the exhibition of the anæsthetic, and immediately resort to artificial respiration of which there are several plans. Sylvester's is probably the best as a matter of routine. Before administering any anæsthetic it is of the utmost importance to ascertain that the patient has loosened all constricting clothes. It is not enough to take their word that they wear nothing tight. We must satisfy ourselves. Collars, braces, corsets, and waistbelts must be unfastened. It is often said that if the neck is not constricted, the patient has full liberty of breathing. This may be so. In the case of women at least, only the upper part of the thorax is generally used in breathing; but we must keep in mind the possibility of having to resort to artificial respiration at a moment's notice; and if in that contingency we had to delay to unfasten clothing we might lose valuable time, and fail to prevent a fatal result.

There is a great risk to life from the possibility of sudden cardiac failure in operating in a condition of imperfect anæsthesia, and on this subject I cannot do better than quote the exact words of Dr. Lauder Brunton. He says :—" Danger arises from stoppage of the heart by a combination of chloroform narcosis and SHOCK. This is one of the most dangerous conditions. It may occur even during full chloroform narcosis in animals from operations on the stomach; but it is much more common in men from IMPERFECT ANÆSTHESIA. In very many cases of so-called death from chloroform during operations, we find it noted as a matter of surprise that death should have occurred as the quantity of chloroform given was so small. The reason that death occurred probably was because the quantity of chloroform given was so small. Had the patient been completely anæsthetised, the risk would have been very much less. The reason why imperfect anæsthesia is so dangerous is, that chloroform DOES NOT PARALYSE all the reflexes AT THE SAME TIME. A very large proportion of the deaths from chloroform occur during the extraction of teeth, and we may take this operation as a typical one in regard to the mode of action, both of the sensory irritation and of the chloroform. When a tooth is extracted in a waking person. the irritation of the sensory nerve produced by the operation has two effects :—1st, it may, acting reflexly through the vagus, cause stoppage of the heart and a consequent tendency to syncope. 2nd, it causes reflex contraction of the arterioles, which tends to raise the blood-pressure and counteract any tendency to syncope which the action of the vagus might have produced.

" In complete anæsthesia all these reflexes are paralysed, and thus irritation of the sensory nerves by the extraction of the teeth has NO EFFECT either on the vagus or upon the arterioles. In imperfect anæsthesia, however, the reflex centre for the arterioles may be paralyzed while the vagus centre is still unaffected. The irritation caused by the extraction of the tooth may then cause stoppage of the heart, and there being nothing to counteract the tendency to faint, syncope occurs and may prove fatal.

"With nitrous oxide there is much less danger, inasmuch as the nitrous oxide causes a venous condition of the blood, with consequent contraction of the arterioles and rise in the blood-pressure, so that any tendency to syncope through vagus irritation is efficiently counteracted.

"With ether, also, the danger is very much less, probably because it has a more equal effect on the centres."

The possibility of asphyxia through blood, teeth, vomited matter, or other substances, passing into the trachea is also to be guarded against. The rule of only operating when the stomach is empty, of cleansing the mouth of blood, of carefully removing at once all teeth and roots, and of thorough watchfulness throughout will be our best protection against disaster from these causes. Also all gags and props used should be absolutely unbreakable.

The question as to whether or not chloroform can kill by direct action on the heart without preliminary stoppage of the respiration is such a controversial one between professed anæsthetists that I fear any opinion expressed in a society such as this, cannot carry much weight; but I think a careful consideration of the physiological action of chloroform in diminishing the excitability of muscle and its capacity for work may possibly furnish a clue to this question, as in the event of a large quantity of chloroform vapour being inhaled it would find its way through the lungs to the heart long before it could have any effect on the nervous centres in the medulla.

We now turn to the subject of when local anæsthetics are to be used, and in what form. There are many persons who, while not wishing to be subjected to pain, yet express a wish, like Sydney Smith, "to be present at the operation." This is a feeling shared by a great number of persons not necessarily wanting in personal courage; and it is no doubt most natural to them not to wish to be deprived even for a short time of the senses and faculties with which they have been endowed. It is also an advantage when dealing with a patient in whom intense fear of the operation presents a danger of syncope to be able to render the part to be operated on insensible to pain, and then to be able to convince him that it is so before beginning the operation. Ether spray may be of considerable use in operations on soft parts where only superficial structures are involved; but it is of very little use freezing by means of it the gum on the outside of the alveolar process when we are about to extract a firmly attached tooth from the inside. It only seems to save the patient from feeling the application of the forceps, and is therefore only thoroughly efficacious in the extraction of loose roots, or teeth with straight, conical roots, which offer little resistance to their easy removal, and require nothing more than grasping and rotation to effect it. Chloride of ethyl has one advantage over ether spray in that it is not quite so unpleasant to the taste and smell; but it is not nearly so convenient of application, its low boiling point and great volatility requiring special vessels for its retention and application. No doubt both these drugs occasionally act to some extent as general anæsthetics when they are so freely sprayed into the mouth as to be inhaled in considerable quantities.

The only local anæsthetic that is of real value in dental surgery is cocaine, and with the use of this there has been considerable success. In cases in which a difficult tooth or root has to be removed; one, in fact, which would probably require more time than is generally available under nitrous oxide; or in which more deliberate action is required than it is generally possible to use under that anæsthetic cocaine may be resorted to. I do not think the disagreeable cases under cocaine bear a larger proportion to the whole number than if no local anæsthetic at all were used. I have never known an injection of cocaine fail in its anæsthetic effect, and although I have seen several cases in which unpleasant symptoms supervened all of them have rapidly recovered on administration of Sal. Volatile. I have adopted the routine plan of giving the patient 30 minims to a drachm of this drug before injecting the cocaine and with this precaution taken beforehand have never had any trouble or unpleasantness whatever. I have only used the hydrochlorate of cocaine, and never from a stock solution. These always deteriorate, unless they contain a trace of salicylic or boracic acid. I do not see the wisdom of injecting additional drugs into a patient's circulation when the necessity for doing so is easily obviated by taking the small trouble of making the solution fresh for each case. Either Burroughs Wellcome & Co's compressed tabloids or fresh crystals of cocaine hydrochlorate may be used ; but in either case they must be kept scrupulously free from any moisture beforehand, otherwise it becomes poisonous. The maximum dose at the first injection is half a grain and it is convenient to make a five per cent solution, dissolving the half grain in ten minims of water, injecting five minims on each side of the tooth to be removed. In a few exceptional cases it is permissible to inject a second dose into the patient's gum if required for the removal of a second tooth; but not until a few minutes have elapsed, giving time to show that no unpleasant symptoms are likely to follow the first injection. If several teeth are to be removed, and the operation cannot be divided, and spread over several occasions, it is better to dilute the cocaine with more water rather than to increase the dose. In no case may steel needles be used. However carefully kept they are apt to rust slightly and become roughened inside, and then can no longer be kept free from stale cocaine solution which degenerates and spoils the next solution used. The needles used should be made of platinum and gold, or platinum and iridium alloy. These are easily obtainable, and should be kept most carefully cleaned; being not only washed but also dried after each occasion. Commence to operate in two or three minutes after the injection, and three or four minutes at least will be available for the operation. Cocaine is of little or no use when the tissues are congested, and is therefore not to be used as a rule to assist in the removal of teeth associated with diffuse inflammation. As a rule there is more than usual hæmorrhage after using cocaine as it dilates the smaller vessels. This it should be mentioned,is secondary,its primary effect being to contract them. In cases of persistent hæmorrhage plugging with a saturated solution of tannin in alcohol is exceedingly useful,and not so disagreeable as some of the remedies occasionally employed. Tannin is much more freely soluble in alcohol than in any other vehicle, and no matter how concentrated the solution it is infinitely better tolerated in the mouth than perchloride of iron. In the absence of as full statistics as I hope soon to possess I can only suggest that the use of cocaine is contra-indicated in cases of extreme heart weakness. It undoubtedly acts as a direct cardiac depressant; and, as it occasionally causes vomiting, its depression action on the heart may be presumed to be by stimulation of the vagus. Cocaine is safe in careful hands, but it is by no means a drug to be played with.

These, Gentlemen, are the chief anæsthetic agents which the dental surgeon of to-day has at his command, and it is in his own hands to make a good and intelligent selection from them, and to use them well, each in its proper place and time. I do not presume to lay down a course of action in every case, but rather to lay before you such suggestions as may enable us by discussion to help each other in deciding what is the proper course to pursue in this really most important and difficult matter.

THE ARTISTIC SUBSTITUTION FOR LOST TEETH.

By J. Maxwell Wood, M.B.,C.M., L.D.S., Edin. Dumfries.

That human teeth are liable to the most sweeping ravages of decay, is a fact as lamentable as it is indisputable. I do not propose to enter into a discussion of the various theories brought forward to account for this disappointing state of matters, but for my purpose accept the situation in its melancholy truth with a view to dwell for a little on the artistic replacement of the lost organs. Very often indeed are we called upon to remove all the roots in the upper jaw as also the roots of the grinders in the lower jaw. The lower front teeth as is well known resist the destructive process of decay longest. In such a case as this as indeed in any case where operative interference has been decided, it will be found good practice to construct for the patient a temporary denture, the interval between the operation and such construction being as short as is consistently possible. The advantages of temporary dentures are manifold. There is the advantage of personal appearance of itself important, but still more important is the fact that natural antogonism of the teeth being lost will lead to an undesirable projection of the lower jaw and diminished functions of certain facial muscles of expression. The upper lip adopts its fallen position as permanent, and in consequence the well defined and beautiful curve of the lip and the natural easy expression of the mouth are not restored in their original beauty. Beyond all this the mouth becomes accustomed to its new and crippled condition, with the result that upon the application of the denture after the alveolar absorption has taken place, unnecessary discomfort and awkwardness is experienced. The comfort of a denture essentially depends upon its fitting accurately. To bring about this result an accurate impression or cast of the mouth must be obtained. Without discussing the merits of the different materials for effecting this purpose, I may say that I personally prefer and use in every case plaster of Paris. My method is to first take a rough impression with modelling composition. This is cooled and trimmed into the shape which a special tray would have if one were made. After undercutting the layer of composition left the impression is taken. The models having been dried and dipped in hot stearine, trial pieces of modelling composition are made. We have now reached the important stage of "taking the bite," as it is termed, and it is at this stage that scope for sterling artistic work is afforded. The trial pieces are now placed in the mouth and by paring away or adding new material, as the necessities of the case insist upon, they are so arranged as to restore the space lost by the removal of the teeth and the absorption of bone. The semicircular front of the trial piece is at the same time carefully trimmed until the natural contour of the upper lip is obtained. Being satisfied that the lost expression of the mouth is restored and that there is no stretching or tension of the corners of the mouth, the patient is asked to part the lips without straining or undue effort.

Three lines are now to be drawn upon the anterior surface of the trial piece. The first is a mesial line bisecting the face. The second is a transverse line drawn at right angles to the mesial line and cutting it at the junction of the middle and lower thirds of that part of the line running between the parted lips. The third line, which I term the "lip curve line" is an outline of the upper lip when the lips are parted as already explained. This is not always easy to obtain, as when touched, the lip tends to retract, but the difficulty is soon overcome by a little perseverance. The use of this line is that it forms an important guide to the length and exposure of the front teeth which it is desirable to give. After the models are fixed on an articulating frame the mesial line is marked. For the lip curve, a piece of stout paper or thin leather is taken, and a curve cut out upon it corresponding to that on the trial piece, and accurately attached to the model in such a way that it is easily folded back when not required. With this artificial lip great assistance in setting up the front teeth is obtained and undue exposure or the antithesis is obviated. The transverse line is also most valuable, and to secure its function the marked trial piece is preserved for reference. This line will assist the manipulator to maintain the broken, but regular line in which natural teeth are found in the mouth. This line is also an indication of the approximate length of the central incisors in well formed mouths. While this line is of great assistance in first setting up the denture, the actual arrangement and correction of the position, length, etc., of the teeth must be made in the patient's mouth.

As an illustration, I well remember a case I had, where the patient had been thrown from a vehicle, and sustained lacerated and incised wounds at the left angle of the mouth. In constructing a new plate, a full upper denture, the peculiar twist of the mouth caused by the cicatricial contraction, complicated matters very much. The denture was practically set up in the mouth, and though when finished it had a curious appearance outside the mouth, yet when in its place the result was very gratifying both to the patient and to myself.

The importance then of adjusting the denture in the mouth while in process of construction, cannot be too firmly insisted upon, and while doing this, the intelligent aid of the patient ought not to be ignored.

The selection of a harmonious shade of colour, and the adoption of a suitable character of tooth is extremely important. Formalism must be strenuously avoided. Dealing with colour, in the first instance, we must, if any natural teeth be left, see that they are accurately matched. If the lower front teeth are left and the upper jaw is edentulous, it is desirable to make the new upper teeth a tone or two lighter. Where there are no teeth left in the mouth we are to be guided by several considerations, such as age, complexion, and constitution. Generally speaking, the older the patient, the darker the teeth, but even more important than this, is the consideration of complexion. For example, a bright, clear complexion requires a light shade, while a dusky pigmented face, a correspondingly dark shade. These are two extremes, and between these are many and various grades. The constitution may also assist the operator in this matter of colour. In the normal constitution a rich dense yellow tinged tooth is indicated. In less vigorous constitutions, such, for example, as the rheumatic and strumous, the impaired structural density of the tooth gives an opaque and chalky appearance. On the other hand, the gouty constitution presents a strong, well shaped tooth with thick white enamel.

The character and shape of tooth next engage our attention. In this matter we have many opportunities of perfecting our ideas by careful study of the mouths approximately perfect, which we meet with while pursuing the conservative element of our work. Whenever a typical mouth is met with where the shape, colour, and the arrangement of the teeth harmonize in artistic perfection with the general appearance of the patient, an impression of such a mouth should at once be taken, with a note of the shade of tooth, sex, age, stature, and complexion. We might with advantage even suborn photography to our assistance. Such a model with a photograph of its owner, with notes appended, might be preserved for reference, study, and application of deductions to practical efforts of realization. Such methods ought indeed to materially assist student and practitioner in making themselves more than mechanical dentists, in the true sense of the word mechanical. Indeed, to my mind, there is no reason why methods such as these should not be more largely dwelt upon in the teaching of dental Prosthetics in our schools.

The practitioner ought never to restrict himself exclusively to one manufacturer's teeth, otherwise he will fall into occasional inconsistent formalism. Where one maker supplies a tooth that will be a happy and suitable adaptation, another maker may have nothing of even comparative resemblance. Good, well-shaped, well-marked teeth are manufactured in this country, but no practitioner is doing himself or his patient justice if he omits American teeth from his stock. Types and shades of the productions of every maker of reputation should be in regular use. The style of face is a clear indication of the type of tooth to be used. If one exercises taste and discrimination, one does not adapt a short square tooth to a refined oval face of the King Charles type. Nor, on the other hand, does one offer to the mouth of a matron, short, stout in body and face, a long, elegant style of tooth, such as would have been eminently more suitable for the former example. Beautiful forms and compositions are not made by chance, and true harmonious co-ordination of artistic instincts must be developed, cultivated, and exercised, in order to do justice to our patients.

Sooner or later cases are met with where the introduction of a little irregularity enhances the effect. In producing such an effect as this, symmetry has to be avoided, or an artificial result is produced. Accurate observation of natural slight irregularity will obviate such artificiality. The line extending along the cutting edge and grinding surface of the molars is not as is often seen in artificial dentures a straight line. It is a sweeping and well defined graceful curve. This must n restoring the lost teeth, be strictly followed out, otherwise a disagreeable fulness will be produced in the appearance of the patient's mouth. In ladies one avoids making the canine tooth prominent. On the other hand, prominence not too much pronounced is well carried off by men. The line of arrangement of the teeth in the arch is also a matter of importance.

The natural outline of the arch in a strong well marked face is oblong, while in a small delicate face this squareness gives place to a curve with a pleasing result not to be attained if squareness is insisted upon. If there is the slightest suggestion of fulness when the patient is smiling or talking, spacing the teeth must be resorted to. If the cutting edges of any of the remaining teeth are ground at the edges a natural effect is obtained by boldly shaping the artificial teeth in a similar manner· For example, a triangular hole in a smoker's mouth for the stem of a pipe will agreeably assist in concealing our restorative art. That this department of dental science is not a mere matter of trading, I think is obvious. In the hands of educated, refined, and skilled men, it takes its place as a distinct branch of art. That it is degraded into supplying and selling teeth as one sells and purchases merchandise, is probably a result of the presence on the dental Register of the names of a large number of uneducated men, who, forsaking other and often curious occupations in contrast, flocked into the dental profession immediately before the passing of the Act of 1878. Now that scientific education, pass examinations, and a diplom, are required of every man who enters the dental ranks, the status of the profession is steadily improving, but undoubtodly this matter of raising the tone of the profession and educating the public, is in the main in our own hands. The public is not slow to recognise when it is being conscientiously, carefully, and well treated, and, if this is correct, and

I have no hesitation in assuming that it is correct, then for the sake of the dignity and honour of the calling we have chosen, let us be unfailing in our endeavours to attain in every case we undertake a consummation as meritorious in its result as it is artistic in conception.

PER-CENTAGE TABLE OF LICENTIATES IN DENTAL SURGERY, AND REGISTERED DENTAL PRACTITOINERS.

Year	Licentiates in Dental Surgery	Registered as in Practice.
1879	9·13	90·87
1881	10·74	89·26
1882	13·06	86·86
1883	14·43	85·47
1884	15·12	84·78
1885	15·90	83·93
1886	16·68	83·11
1887	17·89	81·97
1888	19·94	79·90
1889	20·83	78·97
1890	22·41	77·32
1891	23·36	76·32
1892	24·07	75·55
1893	25·43	74·09
1894	26·48	72·95

British Journal of Dental Science.

LONDON, MARCH 15th, 1894.

A DENTAL CLUB.

The last number of the *Dental Review* contains a letter from London which is of much interest. It describes the formation of a secret club, now some three years old, which has a membership of seven dentists, four Englishmen and three Americans. They have weekly meetings for dining together and talking over such current professional matters as are of interest to dentists. After some discussion and opposition, the secretary has received permission to send a monthly "edited and corrected" report of the proceedings to the *Dental Review*, and so we have this first letter from "The Scribe of the Mystic Seven." It contains a promise that additional letters shall follow in which the individuality of the other members of the Club will come more distinctly into view. At present we are introduced to them by name; not, of course, the ordinary mundane names, but the special club cognomen by which alone they are addressed and referred to. Presuming that we are not dealing with a fairy tale, we suppose that the Club, having taken its new departure will not object to, but rather welcome, a few remarks which may serve to draw attention to its doings. We therefore venture to say something in approval of the new determination, for if the results of these secret conclaves are worth anything it must be good for the information to be made more public. We are promised that, in the future, American methods will be criticised with great frankness, but at the same time, the faults of the English system will not be spared. After this warning it will surely behove any authorities with guilty consciences to put their houses in repair.

The topic mainly dealt with in "The Scribe's" first letter is one to which we have, before now, referred. In order to exploit the British Public more successfully, it has become the custom amongst certain advertisers to adopt the title of "American Dentist," with the result that the work done frequently produces an unfortunate impression upon an ignorant patient. Some time ago we ventured to predict that possibly the genuine American dentist would find it advisable to refrain from claiming any special designation, other than the ordinary dental one. At present, in venturing to assure his patients that he practises methods superior to those adopted (or even attainable) by our own licentiates, he must be prepared to find instances in which he will be classed with others who lay claim to a monopoly of skill. And it is suggestive to find that one of the American members of the Club we are now interested in, is indignant at the indifference shown by reputable English Dentists to such a confusion in the mind of the Public. He even goes so far as to believe that these advertising institutions would have been closed long ago if there had not been a tacit understanding amongst English practitioners that American prestige would in this way be lowered. We are glad to find that "The Scribe" does not share these views, although the ground upon which he bases his objection is not altogether creditable to the reputable Englishmen. We would prefer to believe that the "personal benefit" is not the only reason why the average humane dentist would like to see the public protected.

The Club has collected evidence concerning the "methods of practice" of several quack dental institutions. We have often thought that a systematic accumulation of well-authenticated cases of well-marked predatory behaviour might be of service, say for presentation to the General Medical Council. An instructive instance of the usual "regulation" case is detailed by "The Scribe" accompanied by some very pertinent remarks. If the Club perform no other function than the recording of such observations its members will not have met in vain.

The Late Mr. Francis Lepper.—We understand that the business hitherto carried on by the late Mr. Francis Lepper at the dental depôt in Great Marlborough Street, will be continued under the control of the Executors.

A New Scientific Journal.—We have received the prospectus of a publication which was to have made its first appearance this month. We have not yet seen a copy of "*Science Progress*," but the promises made on its behalf are tempting to those who, whilst not able to go deeply into such reading, like to keep somewhat abreast of the latest discoveries and opinions. The Review in question is to be published monthly, and will deal with various branches of Science, the articles being written by persons specially qualified to deal with the subjects they undertake. The style does not aim to be "popular" in character, although the writing is intended to be intelligible to persons possessing an ordinary scientific training.

Dental Surgeons in Provincial Hospitals.—We have previously alluded to the desirability of the appointment of dental surgeons upon the Staffs of General Hospitals. We have recently had our attention drawn to a newspaper report of the Annual Meeting of the Governors and Subscribers of the Royal Berkshire Hospital. This Institution is widely known and well supported. It is a large hospital, with resident medical Officers, and, we believe, a department for the training and supply of skilled Nurses. And yet there appears to be no provision made for the appointment of a dental surgeon. At the meeting we refer to, we are glad to find that Mr. Armstrong, the Medical Officer to Wellington College, raised the question of establishing a dental department in connection with the Hospital. He was formerly a member of the Surgical Staff, and may be supposed to know something as to the expediency of such a proposal, Unfortunately, as we think, the suggestion was opposed by another member of the Staff, but we trust that before long the matter will be settled in such a manner as will confer, on all concerned,those benefits which we need not at present again detail.

A Reported Antidote to Opium.—Considerable interest has been manifested in the reports, transmitted from America, that a Dr. Moor has "discovered an antidote to all forms of opium-poisoning." According to an account from New York, he found by experiment that a soluble salt of morphia would be rapidly oxidized by permanganate of potassium, and that the resulting product was entirely devoid of narcotic properties. Further, that when introduced into the stomach the permanganate might be relied upon to "select" the morphia out of the other matters present. This convenient arrangement depends upon the fact that the re-action which takes place between permanganate and albumen, or peptone, is much slower than the one between a soluble salt of morphia and permanganate. The discoverer seems to have had the courage of his opinions, for it is related that, in the presence of several physicians he took three grains of sulphate of morphia followed by four grains of permanganate. His colleagues watched him for five hours and all agreed that he showed no symptoms of the narcotic. A correspondent of the *Pall Mall Gazette* writes to say that the remedy was known in England many years ago and was discovored by Dr. Barker Smith.

THE DENTAL HOSPITAL OF LONDON.—The Student's Athletic Club held a most successful dinner on the 6th inst. under the genial presidency of Mr. S. J. Hutchinson. A large number of guests sat down in the Victorian Saloon at the Criterion, and much enthusiasm was shown in connection with the favourable report of the Club's doings and prospects. It has been arranged that there should be a joint occupation of a practice ground with Charing Cross Hospital and this will doubtless prove a valuable acquisition. From the after dinner [speeches it] was made manifest that the Club has strong support from the chairman and the members of the Staff, and one cannot but share the opinions expressed, that a reasonable amount of athleticism must tend to better work by the members of a profession whose environment is not altogether of the healthiest nature. A most enjoyable programme of music and other entertainment followed the dinner.

ARTIFICIAL TEETH NOT NECESSARY.—In our last issue we alluded to the hopeful position taken by the Chichester Board of Guardians. The auditor of their accounts finally came to the conclusion the guardians could grant "relief" in the form of artificial teeth. Another aspect of the *necessity* argument has now been presented in a County Court. A dentist sought to recover £6 from a husband who was separated from his wife. The latter had the teeth, and it was urged by plaintiff's counsel that, as they were necessary, she had power to pledge her husband's credit. The Judge, however, thought this argument unsound, and that if the husband did not provide the denture his credit could not be pledged for it. He further remarked that they had done without "false teeth" for many hundreds of years, and that if the wife appealed to the parish doctor he would not provide teeth. We presume that his Honour was not aware of the existence of the parish dentist, authorized by the Chichester guardians.

Abstracts of British & Foreign Journals.

A FEW CONSIDERATIONS IN SURGERY FOR THE DENTIST.

By Garrett Newkirk, M.D., Chicago.

Septic dangers in dental practice are three-fold, all relating to soft tissues : First to those about the teeth, or in any part of the mouth of the patient ; second, to the dental pulp living or dead, within the tooth ; third, to the flesh of the dentist himself.

So far as dental operations are strictly confined to the cutting of enamel and dentine in the preparation of cavities, and the filling of the same, so long as the instrument does not slip, and is not permitted to come in contact with soft tissues, the danger of infection from a point, though septic, could scarcely exist. It may be a safe assumption that dentine could in no case be infected, but the chance would be exceedingly small. But frequently it is not possible to avoid the contact of instruments with soft tissues, especially those used at the gingival margins, or for the removal of tartar, or preparations of roots for crowns. But the greatest care should be exercised. We should ever seek to avoid the wounding of soft tissues in dental operations. There is too little attention paid to this point ; in fact many operators seem to be utterly indifferent to the matter. They work away upon a tooth in the mouth with no more regard for its surroundings than if it were embedded in wood or plaster ; and this is notably true in the finishing of fillings with strips and discs.

When an instrument slips from the control of the operator, it is usually with force sufficient to produce a wound, it may be a cut, a puncture, an abrasion, or but a simple scratch, sufficient in any case to inoculate the tissue with whatever infective poison the instrument may carry. Were it not that the wound usually bleeds in this highly vascular region so freely as to wash out foreign matter, this being followed by the formation of a protective clot, cases of infection in practice would be far more numerous than they are. It is easy to see in this connection, why a simple scratch or abrasion of surface may be more dangerous than a cut. The man who vaccinates is careful not to make a bleeding wound, but merely to expose an absorbent surface for the infectious matter; for vaccine is a disease, and the matter employed is an infective poison, used to prevent the action of a greater poison and an infinitely worse disease.

The poisons most to be dreaded surgically, so far as known, are those of septicæmia. (abscess producing) diphtheritic, perhaps gonorrhœal, and worst of all, unmistakably, the syphilitic. There is also an affection characterized by swellings, sometimes amounting to dangerous tumefaction, without suppuration, which has been named "Infectious œdema." It occurs not infrequently in the mouth and other parts of the face.

The dangers to the patient pertain also to the operator. The septic instrument is a menace to him. There is not a surgeon who has not this fear and dread for himself. There are few indeed who have not at some period of their careers been in imminent peril from the prick of an infected instrument, or other contact of poison with a broken surface of the skin; and some have lost their lives,

It has not been the object of the author to write an exhaustive paper on these subjects but simply to present, as the title indicates, a "few considerations." Those may be divided into three classes: First. precautions against the making of wounds, and all sources of possible infection. Second, immediate treatment of wounds or other possibly infected places. Third, after treatment in cases of known or suspected infection.

Preliminary to the above named considerations, however, the surgeon dentist should provide himself with a sufficient armament, instrumental and medicinal. These agents need not be numerous. A few, well understood and applied, are better than a multitude.

With regard to the first proposition. it ought to go without saying that all instruments which have been liable to infection should be made aseptic before using on another patient, or even the same patient. The means of this has been so often discussed, and so recently that it would seem uncalled for to dwell at large upon the subject. It matters not so much by what method, *if it is done.* Nevertheless, there are a few points in this connection liable to be lost sight of. The ground of safety is not covered by mere medication, however efficient. It is of little value that an instrument be cleaned and then laid upon a bracket the cloth cover of which is spotted with the accumulated filth of months or years.

Something might also be said of the apparent inconsistency of extravagance in the use of bichloride, lysol, etc., and careful economy as to soap, nailbrushes and hot water. Another thing which needs attention and *emphasis* is this: Whatever is used for the final wiping of instruments should not be used again. It should go to the waste basket or fire. So long as a yard of clean, bleached muslin can be bought and cut into eighty-one blocks four inches square, each of which may be used once and thrown away, there is no excuse for using a mouth napkin twice, or a piece of chamois skin till it resembles a blotting pad.

Again, where is the harm of partially cleansing the mouth of a patient before operation, or in thoroughly cleansing the teeth enclosed by the rubber dam to prevent the infection of instruments, materials, a prepared cavity, or the dental pulp. The last is easily done with alcohol, to which a little oil of cinnamon may be added on cotton. Could anything be more sensible and proper? Yet how many do it?

We have seen that the hospital surgeon and his attendants seek to be thorough in *all* things that have a relation to antisepsis. The gums are highly vascular; there are frequently abraded or broken surfaces at their festoons. The rubber dam needs looking after. No one who has the least idea of antisepsis and a due regard for his patients will use the same piece for different mouths. New dam should be washed. Even though it may carry no serious danger it often aggravates an ulcer or "cold" sore, and frequently has a very disagreeable odour. For washing, it is little trouble to drop a tablet of bichloride and a few drops of cologne or cinnamen essence into the water used, thus making the dam aseptic and safe for contact with mucous membrane, and much less disagreeable to the patient.

The Dental Review.

A FEW THINGS TO BE REMEMBERED.

By L. P. Haskell.

In ninety-nine per cent. of mouths the centre of the palate is hard and unyielding, in fact the only portion of the upper jaw which does not change from absorption or yield to pressure. Unless provision is made for it, the plate will, sooner or later rock. This should be remedied by a "relief" in metal plates, of a thin film of wax on the model, extending well up on the anterior portion to near the margin of the process, and to within a quarter of an inch of the rear of plate. In a rubber plate the relief can be made by burring or scraping the plate.

There are more failures in artificial dentures from *faulty articulation* than from any other cause. To guard against this, in adjusting a denture in the mouth, see to it that none of the six anterior teeth touch,—in fact leave a margin of space. This will prevent the tilting of the plate from the rear. Be sure the bicuspids and first molars on both sides meet uniformly ; have no pressure on the second molar, and especially if the lower occluding molar leans forward, as it would crowd the denture forward.

In arranging the *lower* teeth, commence with the second bicuspid so as to ensure a perfect interlocking of the cusps. The fronts must be accommodated to the space allotted to them by crowding or overlapping, if needed.

In ordering teeth from the dealer, see that bicuspids and molars are provided that have a good length of porcelain *above* the pins, so that if necessary to grind, in articulating, the porcelain will not be ground away. The teeth will also present a more natural appearance.

If you desire to restore the expression of the mouth which has been sacrificed by the extraction of the cuspid teeth, remember this invariable rule, viz : the plate can and should be worn higher over these teeth than elsewhere, and artificial gum made fuller. Leave the necks of the cuspids slightly fuller than the other teeth. Finish the rubber with a festoon around the necks of the teeth. In selecting teeth for metal plate and crown work, if you desire strength, use the perpendicular rather than the cross-pins : they are less liable to crack in soldering.

In polishing metal work, use oil with your pumice both on the felt and the brush. To reach all the depressions and interstices, drive a pine stick into the lathe chuck made for it and with a sharp knife turn it to a blunt point.

The Ohio Dental Journal.

SOME PRINCIPLES GOVERNING THE DEVELOPMENT OF FACIAL CONTOURS IN THE PRACTICE OF ORTHODONTIA.

By Dr. C. S. Case.

The writer stated his belief that we are at the beginning of a renaissance in orthodontia which will not be satisfied with the mere correction of malposed teeth, but will include as indispensable the correction of all facial deformities which have resulted from irregularities of the teeth and jaws, and the development of every esthetic contour of the face that can be accomplished by a scientific application of force to the underlying bony structure. In the ordinary dental practice of correcting irregularities of the teeth, not enough attention has been given to facial effects ; the principal aim having been to bring the teeth to a more perfect position and occlusion. While this has usually resulted in an improvement in the appearance of the face, even when the features were in repose, the development of facial contours from an esthetic standpoint seems rather to have been a result than one of the principal aims of the operator.

In examining dental literature in this department, one is surprised to find so little said in regard to the movement of the roots of teeth, and the methods by which it may be accomplished. Dr. Farrar refers only to the movement of the entire tooth in a lateral direction. It is evident the movement of the roots of teeth is a rare and somewhat modern accomplishment which doubtless never would have been possible under the old regime of regulating plates and their numerous force contrivances. Dr. Farrar thus perfectly states the only method by which a movement of the roots in the direction of the force is possible ; " The secret of affecting a lateral movement of the roots of the teeth lies in relatively fixing the antagonizing ends of the crowns while the force is being applied at their necks."

The purpose of this paper is to show how this principle of force may be applied to the outward and inward, as well as to the lateral movement of the roots of the teeth ; and to illustrate also the importance of this possibillty, when it is observed in this operation that the bones of youth do not remain stationary to be plowed through by the roots in a process of retrogressive metamorphosis, but that a considerable portion of the bone in which the teeth are embedded is carried with the roots in proportion as they are changed in position, thus enabling one to regulate many imperfections of the face, by changing the shape and surface contour of the frame which supports and gives character to the features over all that portion which can be affected by a movement of the bones contiguous to the roots of the teeth.

The facility with which the entire intermaxillary process can be carried backward or forward under a proper application of force to the incisor teeth, has been a source of surprise and pleasure to him from the time when he first attempted the operation—less than a year ago.

He is now able to correct, with perfect certainty of success, any marked depression or protrusion of the upper lip which is mainly due to a malposition of the *roots* of the incisor teeth. Instances are frequent of comparatively perfect alignment and occlusion of the teeth, where because of the position of the roots with a consequent abnormal depression or protrusion of the adjoining bone, considerable imperfection of features and external contour of the face is produced. Marked depression of the upper lip is often mistaken for a prognathous lower jaw, because of the lack of proper fullness in the central features of the face, which frequently affects the shape of the nose and deepens the lines on either side. For the same reason the cheek-bones will at times appear abnormally prominent, giving to the face a broad and flattened appearance; especially if the cuspids, being retarded in their eruption for the want of room, take a more lateral and prominent position. If the lower teeth are in proper relative position and the deformity caused, as is most common, by the lower incisors occluding in front of the uppers, every change desirable may be effected by an appliance attached to the superior teeth alone.

On the other hand, if the entire superior dental arch is narrow and contracted, with a high palatal dome, the teeth long, uncrowded, and not materially affected in position by occlusion, the face will usually be long and narrow, the nose prominent, thin, and of the Roman type. In those cases the entire dental arch and alveolus should be expanded, and the force so applied and controlled as to retain the teeth in an upright position, especially in the process of carrying the anterior teeth forward, which is of vital importance in the restoration of the features of the face. The principal force, therefore, should be exerted upon the anterior, superior teeth and reciprocated by rubber bands extending from the posterior part of the upper appliance to the anterior part of the lower. These bands can be made to exert almost any desired force and be worn continuously.

A large inferior dental arch with the teeth occluding outside of the superiors, may be reduced in size by the extraction of a bicuspid on either side and the anterior teeth forced back to fill the space. If the chin is abnormally prominent below the incisive fossa, teeth should not be extracted from the lower, but the principal change to correct the facial deformity should be accomplished on the upper jaw. He has abandoned all attempts to reduce a prognathous lower jaw by external pressure upon the chin. Rubber bands, extending from the upper to the lower appliance, can be made to exert all the force the patient can stand at the glenoid fossa, and tends to force the lower jaw to a more posterior position. Protrusion of the upper lip at that point where it merges into the nasal septum and orifices may be reduced, when due to a malposition of the roots of incisor teeth alone, causing abnormal prominence of the anterior nasal spine and incisive fossa. This position is not uncommon, even when the antagonising ends are in perfect position, and often with the production of quite a marked facial deformity.

In like manner he is able to force the anterior inferior teeth bodily forward, with the entire imbedding alveolar ridge. Instances are not rare where the point of the chin, the upper lip, and the anterior superior teeth are relatively in proper position, but with inferior teeth so posteriorly placed as to produce an abnormally deep depression or curve in the lower lip along the line of the incisive fossa. By forcing the anterior inefrior teeth forward with the alveolus, a more æsthetic shape will be given to the chin; a change will often produce a remarkable improvement in the general appearance of the face. The same is true, also, in forcing back the inferior incisor teeth and alveolus, when they are so anteriorly placed in relation to the point of the chin as to obliterate the graceful curve of the lower lip. Forcing the inferior teeth and this part of the face forward is often of material aid also in the reduction of that unhappy deformity caused by a prognathous upper jaw with protruding teeth. A large proportion of facial imperfections are due to inartistic relation of those features of the face whose form and contour are governed by the position of the teeth and the peripheral surface of the bone in which the roots are embedded. If, by force appliances attached to the crowns of the teeth of young persons, the roots and the alveolus can be forced outward or inward to any desired extent, a new field will be opened to the practitioner in orthodontia, a principal feature of which will be the correction of many deformities of the face, heretofore considered beyond the reach of orthopedic surgery. In a large proportion of those deformities which seem due to protrusion or recession of the chin, the chin is not far from its proper relative position to the forehead, the upper portion of the nose, and malar prominences, the deformity being due mainly to the relatively imperfect position of the anterior superior teeth and the adjoining bone in which they are embedded.

In constructing an apparatus for forcing the roots and adjoining bone of the anterior teeth forward, wide German silver banding material for the teeth should be selected, that is, 5 or 6 thousandths of an inch in thickness. This should be fitted to the crowns of the anterior teeth near the margins on the proximal sides. Then bars of No 18 E.S.G. wire, slightly flattened, should be soldered to each of the bands in an upright position, and bent so as to lie along the anterior surfaces of the crowns from the apex to where the bars join the band; here they should take a direction somewhat parallel to the gum, but free from the surface to abont one-eighth of an inch above its margin, at which point they should be flattened or thinned so as to be more easily bent forward and firmly clasped around a rigid bar, which is made to extend from anchorage tubes attached to the posterior teeth. This bar which should be very rigid, is drawn without annealing from a No 12 extra hard German Silver wire to No 18 E.S.G. The ends are threaded in the No 4 hole of the Martin screw-plate, and the central portion slightly flattened in the rollers. Then it should be bent so as to rest, when in proper position, in the unclasped ends of the upright bars that have been left open to receive it. Before placing it in position the nuts should be screwed on to work at the anterior ends of the tubes. This apparatus can be made to exert an exceedingly powerful force, but if put into practical use as it now stands the ends of the roots and adjoining bony structure would not be forced forward, notwithstanding the fact that the power is applied directly to the roots somewhat above the cervices. The crowns and the body of the roots, with a portion of the alveolus only, would be moved forward. To complete the apparatus the fulcrum should be removed from the anterior alveolar plate, and placed so that the power can be applied between it and the ends of the roots to be moved. In other words, the crowns should be restricted or controlled in movement so that the applied force may be directed to the roots alone. He accomplishes this by a second bar, much smaller and thinner than the first but proportionately rigid, which rests in depressions in the upright pieces along the occluding ends of the teeth. The ends of the fulcrum bar are threaded and passed through tubes that are soldered to the anchorage bands on each side below the power bar tubes, with nuts which work posteriorly to the tubes.

An apparatus for reducing a prominence of the features by exerting a posterior force upon the roots and alveolus of the anterior teeth is constructed in a similar manner to that just described, with the following exception : (1) The bands should be fitted to the crowns of the incisors near their occluding ends, for the purpose of obtaining a more rigid bearing in the changed application of force. (2) The lower ends also of the upright pieces should be made to clasp the fulcrum bar. (3) The nuts should be reversed in their relative position to the tubes. (4) In moving the roots of the cuspids where required, short sections of pipe are clasped around and soft soldered to the bars to prevent them from slipping through the clasps at the ends of the upright pieces.

When the central features of the face are depressed with anterior superior teeth occluding posteriorly to the lowers, accompanied by the usual real or apparent prognathous lower jaw, great reciprocating force may be beneficially obtained from the rubber bands before mentioned. These are cut from a three-eighths inch rubber regulating tube of good heft, and passed over the projecting ends of the anchorage tubes on the upper appliance to buttons on a lower appliance opposite the first bicuspids. The latter appliance may be so constructed that the force will be distributed to all the inferior teeth and indirectly to the jaw, forcing it to a more posterior position. The elastic force of the rubber bands can be made to do effective work to the full extent of their power, that would otherwise be expended upon a static anchorage neutralizing force on both the upper and lower jaws. They are useful also as an auxiliary in the reduction of a prognathous upper jaw by reversing their attachments.

The Dental Cosmos.

DENTISTRY AND THE OTHER MEDICAL SPECIALTIES.

By Prof. JUL. PARREIDT, of Leipsic.

He defines dentistry as including the knowledge of the teeth, the jawbones, and the mucous membrane of the mouth, the correlation between the teeth and the other parts of the organism, both in health and disease, and the knowledge of tooth, gum, and maxillary prosthesis.

To this must be added the often-occurring painful face neuralgias, as well as diseases of the eyes and ears, resulting from affections of the teeth; the laborious cutting of the wisdom teeth, meningitis through the penetration of pus into the skull cavity from the jawbones; pyæmia and septicæmia following inflammations of the maxillaries.

Among the causes separating dentistry from the other specialties of medicine, are:

1. The number of teeth is so large that patients do not seem to care whether there is one more or less.

If an eye is lost it is a great misfortune; but if a tooth is to be extracted it mostly signifies only a slight pain of short duration.

2. The treatment of the teeth requires hard and painstaking labours.

It is a peculiar fact that those are esteemed highest in society whose activity consists more in head and pen work, though this may sometimes be of far less value to it than that of the men producing urgent work with their hands.

3. Because in the long and laborious dental operations, manual labour has so prominent a share, very few of the completely educated physicians have till now devoted themselves to this specialty.

4. In dental prosthesis the mental labour is evidently still farther removed to the background than in tooth operations.

It is very probable that with the continued specialization and division of labour, there may be a division between tooth prosthesis and dental science. A class of dental mechanics may arise that will devote their whole attention to that part of dentistry, like opticians, instrument makers, etc.

In conclusion, the author says it must be admitted that the dentist requires a better preparation in the humanities, a course of study equal to that of any medical specialist.

Items of Interest.

Reports of Societies.

MANCHESTER ODONTOLOGICAL SOCIETY.

The usual monthly meeting of the above Society was held at the Grand Hotel, Aytoun Street, on Tuesday evening, the 6th February. The President, Mr. P. Murphy, presiding.

Election of Member.

Mr. Geoffrey Hughes, L.D.S. Eng., 19, St. John Street, Manchester, was elected a member.

Casual Communications.

Mr. Simms exhibited a model of an upper jaw, showing a combination of a V-shaped, and a saddle-shaped arch. It was the narrowest arch he had ever seen. He also spoke in terms of commendation of the new carborundum discs. He had found them infinitely superior to the ordinary corundum discs.

The Late Professor Marshall.

The Secretary read a letter from Mr. Marshall thanking the Society for the vote of condolence they had passed to the family upon the death of his son, the late Professor Milnes Marshall.

Mr. Maurice then read his paper on "Some remarks on the use of Anæsthetics in Dental Surgery," which is printed on page 241.

Discussion.

Mr. G. G. Campion said he had listened to the paper with a great deal of pleasure. He thought that they as a profession should use their influence to induce medical men to use ether in preference to chloroform more than they did at present. He had had during his experience some very unpleasant results with chloroform as administered by the ordinary medical man. He had therefore decided never under any circumstances to allow chloroform to be administered in his house, and never to allow the administration of ether or chloroform by anyone who had not had some experience in that class of work. A medical man who had made a special study of the subject should, if possible, be called in to administer chloroform. Of course there was the difficulty Mr. Maurice had pointed out, that ether was more difficult to administer and required special apparatus, but it was a difficulty which should not stand in the way of the use of this agent. With regard to cocaine he had of late given up its use entirely, but with the use of *sal volatile* as recommended by the essayist, he thought he should recommence its use. He thought by that precaution all unpleasant results could be avoided.

Mr. D. Headridge thought they could scarcely have a lengthy discussion because the members present were almost entirely in accord with the views expressed by Mr. Maurice. He himself had come to the conclusion that in the administration of ether or chloroform it was desirable to have a specialist. With regard to chloride of ethyl he thought its only effect was to numb the gum. He, too, felt inclined to recommence the use of cocaine, after the encouraging report by Mr. Maurice.

Mr. Simms said Mr. Maurice was to be congratulated on having interested the members in a subject which had been so often discussed by this and other Societies. He should like to emphasize what Mr. Maurice had said in regard to the advisability of having a specialist to administer ether or chloroform. He thought they could do a great deal for the safety of their patients by having a medical man to administer ether or chloroform who was fully qualified by practical experience to do it. With regard to chloride of ethyl its effect was very much increased by dipping the vial in hot water just previous to use. He thought that its value was not very great in the extraction of teeth, but it was very useful in minor operations about the gums. He, too, endorsed Mr. Maurice's dictum that they should insist on their patients loosening any article of clothing that might constrict the throat or chest. It seemed to be an open question at present whether the admixture of oxygen with the nitrous oxide gas was an advantage or not, but he was glad to see from a paper read at the Odontological Society by Dr. Pickering, and published in the Dental Journals, that experiments were being made which would help to settle the matter.

Mr. W. A. Hooton said he could not agree with the previous speakers in regard to the use of cocaine, as he himself simply loathed it, and never gave it from choice. For minor surgical operations in soft parts which could be easily injected, or even painted over with the solution it was of value, but the resistance offered by the gums and subjacent tissue was a serious drawback to its use in dentistry. As regards the administration of gas he was of opinion that the supplemental bag would soon be a thing of the past. It certainly afforded the operator one means of seeing whether the patient was breathing by the emptying and filling of the bag, but he thought they could dispense with that test now. Besides, it induced the reinspiration of carbonic acid gas and effete matter into the lungs, which was deleterious. He was of opinion that the mixture of oxygen and nitrous oxide gas ought to be more generally used. They all knew that nitrous oxide pushed beyond a certain limit produced asphyxia ; an addition of 10 per cent. of oxygen did away with this danger, besides prolonging the anæsthesia. Dr. Hewitt, as the result of an experiment had found that it was possible for a dog to inhale a mixture of nitrous oxide gas and oxygen for 72 hours, and survive. Then there was the point whether chloroform acted upon the heart directly or whether it only acted on the nervous centres and on the respiration. Well, the Hyderabad Commission resulted in a very strong opinion being expressed that it did not act directly on the heart. On the other hand Dr. Pickering had shown by a most ingenious series of experiments that ether and chloroform, when applied directly to the heart, the action of the nervous system being eliminated, produce the one a stimulant, and the other a depressant effect.

Mr. Dykes said that from the glowing account given of cocaine by Mr. Maurice he felt inclined to give it another trial. He thought it was quite possible that the drug had been improved and so would give better results. He had found chloride of ethyl of use in extracting the temporary teeth. He had never used the supplementary bag in administering nitrous oxide, and did not believe it was necessary.

Mr. Broughton said he thought they had often to teach the average medical man something in regard to the administration of nitrous oxide gas. He, too, felt inclined to give cocaine another trial. He himself had seen operations performed on patients who had been hypnotised and from the results obtained he felt that if every patient could be put under its influence no anæsthetic agent of any kind would ever be used again. On the whole he considered nitrous oxide the safest anæsthetic they had.

Mr. Renshaw said he had tried cocaine as a local anæsthetic, and chloride of ethyl, but he pinned his faith for dental operations to nitrous oxide gas. A week at least ought to elapse between each administration of gas. The patients must on no account wear tight clothing.

Mr. P. HEADRIDGE said that as far as his experience had gone he would rather operate under chloroform than ether. Patients upon whom he had operated under the influence of the latter had shown most disagreeable after-symptoms. He thought cocaine was scarcely satisfactory as a local anæsthetic.

The PRESIDENT said he had never injected cocaine in his life. His reason for not doing so was the unfavourable statistics given by Mr. Cunningham, who described some serious cases which had resulted from its administration. With regard to nitrous oxide gas, he thought that they were all agreed that it was the safest anæsthetic for dental purposes. In regard to the question of calling in a specialist to administer ether or chloroform, that was a matter not so simple as it appeared. In large towns such as Manchester, it would be easy for such a specialist to find abundant practice, but in smaller towns it would be impossible.

Mr. MAURICE having replied to the various criticisms the President expressed to him the thanks of the Society for his admirable paper.

Dental News.

DEATH UNDER THE INFLUENCE OF NITROUS OXIDE GAS.

At the City Coroner's Court, Golden-lane, Mr. S. F. Langham held an inquest on the body of Frank Lee, aged 25, manager to a colonial merchant, late of Crowhurst-road, Brixton.

Henry Creasy, a dentist of 88, Newgate-street, deposed that the deceased came to consult him with reference to having a tooth extracted with gas. He appeared to be in good health and was put under gas by Dr. Adams, of Aldersgate street, who had previously examined him. He seemed to take the gas very well, and witness extracted the tooth. The deceased went on breathing for about a third of a minute and then the breathing became stertorous. The doctor at once pulled the deceased's tongue forward, and he was afterwards taken out of the chair, and artificial respiration resorted to. Ether was also injected, but finding that artificial respiration was of no avail the doctor performed tracheotomy. This also proved of no avail, as the deceased's throat was full of mucus, which seemed to impede breathing. After half-an-hour's work artificial respiration was given up, the deceased being found to be dead.

Dr. John Adams, 180 Aldersgate-street, stated that he had administered gas at Mr. Creasy's establishment during the last 20 years, and had had to deal with about 40,000 cases. Of that number the present case was the first that had proved fatal. In further answer to the coroner, the doctor said that when he found that deceased was not breathing properly, nitrate of amyl—a vapour—was applied to the deceased's nose and ether was injected under the skin, tracheotomy being afterwards performed, but all efforts to rally the deceased proved futile. Death was due to apnœa, the air-passages of the lungs being blocked. The doctor added that the deceased had taken from four to six gallons of gas.

Dr. Norman Moore, lecturer on medicine as St. Bartholomew's Hospital, who had made the post-mortem examination stated that all the deceased's organs were healthy, but he found no air in the lungs, and they were very much engorged with blood. There was also a great deal of thick mucus in the bronchial tubes, and death was caused by asphyxia. In reply to the coroner Dr. Moore said he believed that everything had been done for the deceased that was possible. He added that deaths from gas were excessively rare.

The jury eventually returned a verdict of Accidental suffocation, and added that no blame attached to the dentist or surgeon.

ACTION AGAINST A DENTIST.

At Bacup County Court, before His Honour Judge Coventry, John Smedley Turner, sewing machine agent, of 32, Manchester road, Haslingden sought to recover £40 from James Rothwell Taylor, dentist, of Market-street, Bacup, for damages for alleged breach of agreement, under which defendant undertook to teach plaintiff the business of surgical and mechanical dentistry.—It appeared that in December, 1891, defendent entered into an agreement with plaintiff to teach him surgical and mechanical dentistry, in consideration of which plaintiff paid a premium of £50. Plaintiff attended at defendant's place of business two or three times a week for eight or ten weeks, but after that he only attended occasionally. He had the run of the place, but was not allowed to operate on Mr. Taylor's patients.—For the plaintiff it was contended that Mr. Taylor failed to teach him the business, and that in some special branches of the business he was incompetent to teach him.—Mr. Beaumont of Rochdale, with whom Mr. Taylor served his apprenticeship, gave evidence as to Mr. Taylor's competence to teach the business, and said the special branches of the business referred to by the plaintiff were not usually included under an agreement of this character, and were not practised by the ordinary run of dentists. His Honour held that there had been no misrepresentation and no breach of agreement on defendant's part, and gave a verdict for the defendant, with costs.

APPOINTMENT.

Mr. W. A. Hodson has been appointed Honorary Dental Surgeon to the General Hospital for Sick Children, Manchester.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

RAILWAY CARRIAGE OF N_2O.

To the Editor of "The British Journal of Dental Science."

Sir,—Last week having occasion to send to London for Nitrous Oxide, it not having arrived at the time expected, I enquired at the office of the South Western company about it, and was then told by the Agent, that about five or six months ago, a messenger carrying a bottle of it to the Waterloo Station, accidentally let it fall, when it exploded and killed the messenger, therefore the company now refused to carry it. I would like to know the truth. Could any of your numerous readers kindly give me their opinion on the Elmwood Gas Engine—does it work satisfactorily?

Yours truly,

S. G. HUGO.

Guernsey.

[*** Some such an accident did occur, and a scientific investigation was made as to the cause of the fracture. We have communicated with the Railway Company. It has been decided to resume the carrying of Compressed Oxygen Gas by Passenger Train, provided the cylinders are packed in baskets, boxes or hemp, and that a Consignment Note be handed in by sender endorsed as follows:—" The cylinder used for this consignment complies with the condition that it must be of wrought-iron or steel of sufficient strength, and efficiently tested."—ED.]

THE ETIQUETTE OF THE PROFESSION.

To the Editor of " The British Journal of Dental Science."

Sir,—Many of your readers will doubtless sympathise with Mr. Reynolds-Ball in his complaint against the Anglo-American dentist who failed to keep a deliberately-made appointment. It is not quite clear what good result can come from the publication of his letter, but as it is in print will you allow oue, at least, to protest against the action in question being taken as typical of what may be expected from the ordinary run of dentists. Your correspondent should not judge the many from the behaviour of one. Mr. Reynolds-Ball has probably, by word of mouth amongst his acquaintances, helped to complete the advertisement which such a great man obtains from his somewhat eccentric but independent conduct. All " great " men are commonly allowed to be irresponsible on ethical matters, and Mr. Reynolds-Ball no doubt has discovered that Anglo-American, or other geographically specialised dentists may be no exception to the rule, especially when resident abroad. Fame, or even merely notoriety, is as the breath of life in the nostrils of such prophets. The one satisfaction your readers can be gratified with is that the identity of their fellaw-practitioner has not been disclosed. Perhaps as far as he himself is concerned, " 'e don't no where 'e are," but, let us be thankful, neither do we.

I am, Yours, &c.,

A DENTIST.

KEEPING APPOINTMENTS.

To the Editor of "The British Journal of Dental Science."

Dear Sir,—In your last issue a gentleman writes to complain of a dentist not having kept an appointment. We do not know the other side of the question, but there are few dentists I imagine who could not turn the tables and complain of bad treatment on the part of patients who do not even take the trouble to send a telegram as this dentist did. I have heard that some dentists warn their patients that a fee will be charged unless due notice is given that an appointment cannot be kept. I should like to know how far such arrangements are binding legally. Is it a contract one could sue upon?

AUDI ALTERAM PARTEM.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
6. The Journal will be supplied direct from the office on PREPAYMENT of subscription as under:

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British Journal of Dental Science.

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THE JOINT OF THE JAW.*

By Mr. Walter Spencer, M.S., F.R.C.S., Eng.
Assistant Surgeon to the Westminster Hospital.

Gentlemen,—The general surgeon and the dental surgeon have a common interest in the diseases of this joint, and the subject is dealt with in text books, especially in that by Mr. C. Heath, your consulting surgeon. I hope to mention some points of importance to the dental surgeon without presuming to enter actually into the domain of dental surgery, from cases which in one way or another have come under my notice. In doing so I shall have to include the extrinsic causes of impaired movement.

The name of the joint.—As the title of this paper shows I think the English words are not sufficiently used. The word "jaw," involves the idea of "chewing," the half of the lower jaw separated at the symphysis is the jawbone,and there is but one joint on each side connected with the jaws. I would urge therefore the employment of the term "joint" or "joints of the jaw," (no one need use "jaw joint" if he finds it difficult), instead of the longer term"the temporomaxillary articulation." In Morris's Anatomy the word "mandible" is introduced from

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*A paper read at a meeting of the Students' Society of the National Dental Hospital, on March 2nd, 1894.

Comparative Anatomy, and of course there can be no objection to the name itself for both "maxilla" (through "mala") and "mandible" are derived from "mando, I chew." But alterations in anatomical terms are to be deprecated except on the report of an International Commission for Anatomical Nomenclature.

Growth of the Jaw.—Arrested development of the mandibular cleft when the auricle, the external auditory meatus, the middle ear and the eustachian tube are more or less imperfect is attended by an absence* of the condyle and neck. There is a short vertical ramus, but the horizontal ramus and teeth are fully developed and the movement of the jaw free.

Any affection of the joint at an early age disturbs the articular cartilage of the condyle from which the vertical ramus partly grows. And the fixture of the joint leading to disuse and wasting of the muscles attached to the bone tends to hinder the growth chiefly of the vertical ramus, but partly also of the horizontal ramus. Lost ground may however be regained if the movement be freed whilst the patient is still young.

If the lower jaw be arrested in its development on both sides,the face especially in profile has a birdlike aspect, the face appearing to be continuous with the neck without a projection of the chin. Langenbeck† has figured the condition of the bones from a museum specimen and described the well-marked case of a young man in whom the line of the lower incisors only reached as far forwards as the bicuspids in the upper jaw. The jaw had never been opened, only fluid food having been taken, from the shortened state of the masseter and temporal muscles. After subcutaneous division of the masseters and excision of the coronoid processes the mouth could be widely opened. Bassini and Baiardi[*] have described similar cases, e.g. one of a child 18 months old, whose mouth could only be opened 1mm. until after division of the coronoids and masseters. Arrest in development has arisen from injury at birth. A girl under Von Bergmann[†] aged 20, had been born after a prolonged operation with forceps and the mouth had never been opened She had lived solely on fluids sucked through the teeth. A spatula could not be passed between the teeth, the lower incisors being in contact with the hard palate in the line of the upper bicuspids. After excision of the condyle, the mouth was opened to the extent of 3 cm. The application of the forceps had set up a traumatic arthritis followed by bony anchylosis. After the excision the lower jaw was considerably advanced upon the upper by the dental surgeon.

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* Canton. Arrest of development of the left perpendicular ramus of the lower jaw. Pathological Society's Transactions, 1861. Vol. xii., page 237, plate.

† Langenbeck. Angeborne Kleinheit des Unterkiefer mit Kiefersperre verbundem, geheilt durch Resection des Processus Coronoidei. Archiv fur Kiicnshe Chirurgie, 1860-61. Band i, s. 451, with Tafel v., Fig. 1—3.

In a number of these cases of ill-developed jaws, a rapid increase in size has followed on the free exercise of the muscles after operation.

Injuries.—Fracture of the neck of the condyle requires great violence. As in the case described by Holmes[‡] a fracture of the base of the skull, with the lower fragment driven into the external auditory meatus, is produced at the same time. The presence of crackling and stiffness of the joint following an accident has been diagnosed as due to a fracture of neck, but in one case the jaw was pushed forwards and to the opposite side, and I believe such cases to be dislocation of the interarticular cartilage.

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[*] Baiardi. "A Case of Congenital Closure of the Jaw." Lo Sperimentale, 1891. Anno xlv., page 32.

[†] Von Bergmann. "Zur Kasuistic der Arthrogenen Kieferklemme. Archiv fur Klinische Chirurgie, 1893. Band 45, s. 664.

[‡] Holmes. "Fracture of the neck of the right condyle of the lower Jaw with displacement." Pathological Society's Transactions, 1861. Vol. xii., page 159.

Injuries.—Dislocations occur not only in aged women but in persons with relaxed ligaments such as anæmic girls, women after childbearing, or specific fevers, and in boys. In such cases the dental surgeon should be on his guard. There is no rupture of the capsule, it is the external lateral ligament which stretches, the interarticular cartilage generally moves forwards with the head and returns on reduction.

Occasionally reduction is difficult when it would seem likely to be most easy, viz., in old women. I was asked to see an old lady who had a unilateral dislocation after vomiting. Her doctor had failed to reduce it under anæsthesia. I likewise tried in the ordinary way and could not get the jaw back, but noticing the coronoid process projecting into the mouth, internal to the zygoma, I pressed upon it and obtained immediate reduction. I then inquired into the matter and found that the same difficulty had occurred to others. If the atrophied lower jaw of an old woman be examined, it is seen that the thumbs placed behind the molar teeth really press in the line of the stylomaxillary ligament on account of the obtuse angle formed by the atrophied jaw, whereas pressure on the apex of the coronoid process makes leverage of the third system, the power being applied between the fulcrum at the angle of the jaw as fixed by the stylomaxillary ligament, and the condyles the weight to be moved.

Recurrent Dislocation.—Patients who are likely to be careless should be made to wear a bandage for a month after dislocation, and should be told to mention that it has happened to the dental surgeon before any manipulation on the mouth. F. Marsh* has shown that the tendency to repeated dislocation —and some have had it more than twenty times and on the slightest provocation—may be prevented by stitching down the interarticular cartilage to the periosteum and shortening the external lateral ligaments.

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* F. Marsh. "Recurrent Dislocation of Lower Jaw." British MedicalJournal, 1892. Vol. i., page 907.

Internal Dislocation.—Some patients are able to make a click with the jaw as others with the thumb. In such people when under an anæsthetic, a subluxation may be produced by a gag, but this usually disappears on pressure with the thumb applied to the condyle. Much more troublesome are those in which the meniscus is rucked up. When this happens the joint is more or less fixed, and the jaw protrudes forwards and to the opposite side, if the injury be unilateral. Such an accident occurred to a student contemporary with me, in falling from a bicycle, and to two women under Annandale* from vomiting and yawning. Free movement under gas may be obtained, but the accident is liable to recur from trivial causes such as opening the mouth widely, and the only cure is that of stitching down the cartilage as done by Annandale, or by removing the cartilage altogether.

Dislocation Backwards.—Apart from the forcible driving back of the lower jaw into the external auditory meatus or following necrosis, it is said that the condyle can move backwards and lodge between the tympanic plate and the mastoid process,†this tympano-mastoid fossa being larger in women. The special signs are closure of the mouth with inability to open and a filling up of the depression between the antitragus and the condyle. The cases supposed to be such appear to be similar to those of internal dislocation of the cartilage, and this dislocation backwards has not yet been produced on the cadaver·

Acute Inflammation of the Joint.—Septic inflammation is the important form either general or by direct extension from ear disease, especially after scarlet fever. This latter is favoured by the canal for the chorda tympani nerve, and that for the tympanic artery by which suppuration may spread from the necrosing temporal bone. Rheumatic fever rarely attacks the joint, and does not lead to adhesions. There are two women in the Westminster hospital at present in whom except for some slight movement of the hands and fingers, all the joints of the limbs are completely fixed, and yet one can open the mouth widely and in the other, movement is but little less than usual.

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* Annandale. "Displacement of the Interarticular Cartilage of Lower Jaw." Lancet, 1887, Vol. i., page 411.

† Thiem. Ueber berrenkungen des Unterkiefers nach hinten. Archiv fur Klinische Chirurgie, 1888. Band 37, s. 529.

‡ Albert. Neuer Medinicshe Wochenschrift, 1892. s. 875.

Chronic Inflammation.—Gout and Rheumatism may be a source of great pain but they do not tend to a fixed joint. Humphry* successfully excised the condyle for relief from pain. It has been said to give rise to hypertrophy of the condyle, but it is a question whether this hypertrophy of the condyle and more or less of the body of the bone may not be a form of acromegaly.

Acromegaly.—If due to acromegaly, then the enlargement of the jaw will continue. A case in point has been mentioned in which a dental surgeon, not recognising the disease attempted to fix plates on the steadily increasing jaw.

Locomotor Ataxia.—I have seen one case of grating and excessive mobility of the joint in a patient, the subject of Locomotor ataxia, other joints being also involved.

STIFF JAW. I will now allude to the various means of treating stiff jaw, in order of severity.

Functional.—Semon† has exhibited recently a case of immobility of the jaw suddenly attacking a clergyman whenever he wished to preach. In this case speaking in the declamatory tones of an actor was recommended.

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* Humphry. Medical Association Journal, 1856, page 60.

† Semon. Proceedings of the Laryngological Society, 1893—94.

Reflex Spasm.—This is of course the common form coming before the dental surgeon. Whilst being generally connected with the wisdom tooth, it does not seem to be produced from any other than the lower molars. Of course in more advanced stages the infiltration of the muscles by the inflammation may arise in connection with any tooth and tend to fix the jaw.

Central Irritation.—Tetanus.—Although rare, the possibility of the occurrence in a patient who appears ill, and in whom there is no sufficient ground for blaming the teeth, must be borne in mind. Some septic puncture or wound with pain extending up the nerves will suggest a further medical examination.

Fibrous Adhesions.—Free passive movements, started whilst the patient is under gas, may be employed, and the inunction, over the joint, of mercury. A rubber block may be placed between the jaws, the chin being drawn up so as to keep the joint surfaces apart. Or the patient may wear a gag at night until all tendency to closure has passed away.

If the mouth has to be opened by a screw gag, not only must care be taken of the teeth, but it must also be remembered that bones atrophy and become fragile when the muscles attached to them are not active. And there is no advantage in using great force, for even if the mouth be forcibly opened, yet a relapse will probably ensue, and excision of the condyles be in any case required. Spanton* has divided fibrous adhesion by passing a tenotome into the joint.

Excision of the Condyle.—For all firm fibrous and bony fixtures, excision of the condyle is the most satisfactory operation. An incision is made horizontally along the lower border of the zygoma, through skin, fascia and masseter muscle, and an incision through skin only down the vertical ramus at right angles to the first one. Then the masseter, the upper twigs of the facial nerve, and the parotid duct are drawn down. The neck of the bone is divided and the head removed often only with considerable difficulty piecemeal, by the use of the saw, chisel, and even forceps and gouge. The external carotid, and also the superficial temporal arteries have been cut and are ligatured without difficulty. If the internal maxillary be injured, ligature is difficult, even in a good light. The wound may have to be plugged. Free movements by day and a gag at night must be kept up for a long time. If the wound suppurates, relapse and the refixture of the jaw may happen, but after union by first intention the results are good.

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* Spanton. Lancet, 1881, vol. i., page 616.

Operations through the Mouth.—Rizzoli* divided the jaw with forceps; and inserted a pad of rubber to form a false joint. The neck has also been divided by a chisel, and the ascending ramus by a saw.† But these operations are not likely to be often done on account of the danger of starting septic necrosis by extension from the mouth. In case excision of the condyle fails, Esmarch's‡ operation may be resorted to, viz., a removal of the angle of the jaw in the form of a wedge ; simple osteotomy is shortly followed by reunion. A false joint between the horizontal and vertical ramus, is of course not so good as that obtained by removing the condyles.

Cicatricial Contractions. (Spurious anchylosis).

(*a*) This may chiefly affect the mucous membrane generally following mercurial stomatitis. An excessive amount of mercury may be administered, not only as against syphilis, but also in the form of calomel for intestinal disturbances in children.

The bands have to be divided and the mouth wedged open for some time after healing, at first continuously, later on during the night.

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* Rizzoli. Quoted by Heath.

† Heath. Lectures on Diseases of the Jaws, 1878. Pages 110, 111.

‡ Esmarch. Die Behandlung des narbigen Kieferklemme durch Bildung eines Kunstlicher Gelenke um Unterkiefer. Kiel 1860.

(*b*) The mucous membrane and the muscles may be attacked by noma after a specific fever. As the ulcer is healing the contraction must be prevented as under (*a*).

If it already exists it may be treated by separating the insertions * (disinseration) of the masseters and internal pterygoids, by means of a raspatory through an external wound just beneath the line of the jaw. The temporals are but rarely shortened, if so the coronoid processes may be removed.

(*c*) When the whole thickness of the cheek is affected by a noma or cancer, some plastic operation must be done. One † consists in turning down a flap of skin from the forehead, with the epidermis inwards to form the mucous membrane of the cheek, and another flap raised from the neck to cover the other with its epidermal surface outside; the pedicles of the flaps are divided about the twelfth day, and the gaps left in the forehead and neck, covered in by Thiersch's method of skin grafting.

A burn may produce great deformity. Most of the contraction in the case of a superficial burn (and it is not likely that the patient would live to recover from a deep one in this situation), may be avoided by the aforementioned method of skin grafting, whilst the ulcer is healing.

A fixed jaw is a source of danger to the patient, for respiration may be impeded when suffering from nasal catarrh —vomit has to pass through the nose, and there is a possibility of regurgitation into the trachea. No patient with a fixed jaw in which there is the chance of the jaw not being opened quickly by the gag, must be anæsthetised without the surgeon having at hand the instruments for tracheotomy.

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* Le Dentu. "Cicatricial Contraction of Lower Jaw treated by disinseration of the Masseter and Internal Pterygoid muscles." Bull et mem. Soc. de Chirurgie de Paris, 1891. xvii., page 62.

† Bardenheuer. "Plastic Operation for Cicatricial Contraction of the Lower Jaw." Deutsche Medicinische Wochenschrift. 1891. s. 772.

ROOT-FILLING.*

By Harry Baldwin, M.R.C.S., L.D.S. Eng.

The question which arises at the outset, in the consideration of the advisability of immediate root-filling, is as to the nature of the objection which is raised against it.

The objection commonly urged against it, is that pericementitis in some form is more likely to ensue, or become uncontrollable, after immediate-root-filling, than after root-filling which has been preceded by previous treatment.

In order, then, to pave the way it seems necessary to state the nature of this pericemental inflammation, and the manner in which its causes come into operation. Everything seems to show that the pericementum primarily becomes inflamed by absorption of some of the products of putrefaction, and some of the micro-organisms which cause putrefaction, both of which previously lodged within the pulp canal; and that it may be kept up by the micro-organisms thus absorbed living and proliferating within the pericementum, and thus supplying fresh quantities of toxic material. For this absorption primarily to take place, it seems to be necessary that these putrid products and organisms should come into actual contact with the pericementum at the apical foramen. Virulently putrid material may be lodged in the pulp-canal without any irritation of the pericementum, provided that it remains entirely within the canal, but if any force intervenes which displaces some of this material out of the end of the root into contact with the pericementum, inoculation may be effected, and inflammation set up. There is nothing to support the idea that the pericementum can ordinarily be infected through the substance of the dentine and cementum; in fact, the channels which unite the dentinal tubules with the canaliculi of the cementum are so exceedingly minute that the tooth substance may here be regarded as a solid wall, effectually barring the progress of irritant matter, excepting in those rare cases where pathologically large channels run transversly between the pulp-canal and pericementum.

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* Read before the Odontological Society of Great Britain.

It might be objected here that if this theory were all sound, it would be always safe to fill a tooth with putrid pulp-canals at once, without removing the putrid contents, provided no force were used which could displace any of the putrid material into contact with the pericementum. This treatment we know is unsuccessful in practice. The inflammation which follows is probably to be explained, not so much by pressure of malodorous gas upon the pericementum —though the gas would inevitably collect under pressure— but by some of the putrid material being forced into contact with the pericementum by the pressure of this gas. This seems especially likely when we consider that the gas would be generated throughout the mass of the putrid material, and chiefly at the end of the root furthest from the apex, where the putrescent material would be in greater quantity, and the gas from which would be in a better position to project a quantity of the poison against the membrane.

Now, as to the claims of immediate-root-filling.

Its advantages. (1) It is obviously a great advantage to both patient and operator to be able to immediately permanently fill a root with the certainty of success, in the case of patients who cannot give another sitting.

(2) It is obviously a saving of time, as there is but one fixing of rubber-dam, and there is no time lost in placing and removing unnecessary dressings.

(3) It is an advantage to plug the apical foramen as soon as safe to do so, as the pericementum is thereby safe-guarded from sundry forms of irritation, not the least of which are sundry pricks inflicted upon it by nerve bristles, and, again

the alterations of tension, which the insertion and removal of wet wisps of cotton wool inevitably produce when they fit the channel more or less tightly, as they generally do, and so act as a piston.

(4) In addition are the collateral advantages of inspiring a perfection of manipulation and a thoroughness of procedure, which are of great value. It is only by very delicate and thorough treatment, with regard to the removal of putrid material, the avoidance of displacing any through the apical foramen, and the gaining of thorough and direct access as far as possible to all parts of the canal, that success is at all likely to be attained.

Its disadvantages. Provided there is perfect safety in it, there are no disadvantages in immediate-root-filling.

The advantages, however, are considerably lessened by the facts that its perfect safety is in all cases doubtful, unfortunately, and that there is usually an insufficiency of time during a first sitting to carry through all the processes of opening up, cleansing, and filling the cavity of the pulp-canal and the cavity of decay, and again by the facts that a trial dressing takes up but a very little extra time, provided the patient has to come again, and that if followed by serious inflammation, the consequences of immediate-root-fillings are very sad.

It may be noted here that if, as usually happens on a first visit, there is an insufficiency of time to carry through all the processess incidental to the treatment of a dead and putrid tooth, it is advantageous that all the preparation should be done on the first day, and all the filling on the next, if no inflammation of a threatening character has intervened, as by this means the tooth is tested, and very often one thorough drying and application of the rubber-dam suffices, viz., that which has to be done for the fillings.

Now an enumeration of the *dangers* of immediate root-filling.

(1) When introducing a nerve-extractor or nerve-canal drill into a root which contains putrid fluid, it is exceedingly likely that the tension so produced will displace some of the putrid fluid into contact with the pericementum, or even quite through the apical foramen. The immediately subsequent attempt at disinfection may fail to neutralise the activity of this poison, and a painful inflammation may be set up, which, if the canal is irremovably filled, cannot be directly treated nor pressure relieved ; while the converse is the case if the root-filling admit of easy removal. The danger in this direction would probably be greater in the case of those teeth which were affected by incipient pericementitis at the outset of the treatment, as here the membrane would be of lowered resistance and more prone to become acutely inflamed.

(2) When roots are causing abscess without "fistulous" opening there may be a considerable potential cavity in the jaw, eroded by the ulcerative process of the abscess. In many cases it will be impossible to thoroughly sterilise and evacuate this cavity by one operation, and then immediate-root-filling will result in an aggravation of the symptoms, if, indeed, any symptoms previously existed.

Again, supposing that an abscess cavity can be sterilised, but that it remains full of pus when the root is filled, then the best that can happen is that the pus may become inspissated, and represented by a cheesy mass. Mr. Lawson in a clinical lecture, was once very emphatic in declaring that in his opinion not one drop of pus in this world had ever been absorbed, but all cases of seeming absorption of pus were really cases of inspissation. It may be argued that there is no objection to a cheesy mass, but this is not so, as inflammatory changes are more likely to ensue in after-time in the neighbourhood of such a dead deposit than at a spot more normally conditioned.

In the opposite method of treatment, viz., the treatment by dressings, the pulp-canal is left open to drain, and antiseptics are introduced at intervals into the canal, and, if possible, pumped through into the potential cavity. Thus the potential cavity becomes more or less rapidly obliterated by the general skrinking together of the inflamed and expanded tissues, if the case be acute, or by the formation of granulation tissue if the case be chronic. In all other parts of the body this is the accredited and most generally successful method of treating abscesses, viz., to combine drainage with disinfection, and so insure the cavity healing up from its base. Thus it is seen that where there is practically an alveolar abscess-cavity in the bone, immediate-root-filling runs counter to all the ordinary acceptations of surgical theory and practice.

Now as to general rules. In every case the canals should be opened up thoroughly and vertically, preferably with German screw-cut burs for the crown, and conical burs for the canals, until instruments can be readily introduced into all the canals without bending.

A good filling for pulp canals should be solid, unirritating, antiseptic, and removable, and should fill up the whole length of the canal. For reasonably safe roots I prefer as a root-filling a stiff solution in chloroform of gutta-percha and hydronaphthol, plus a sufficiency of cotton-wool fibre to carry it into place, and gutta-percha points where the canals are large. This is easy, penetrating, antiseptic, non-irritating, permanent, solid, and can always be removed with a blunt-pointed, nerve-canal drill.

For canals which are not considered very safe ones, or which cannot be followed far owing to curvature of the roots. I recommend a root filling of a mixture of hydro-napthol, eucalyptus oil, and French chalk on a wisp of cotton-wool.

This mixture sets into a crystalline mass, but at the temperature of the body is not too stiff to prevent its being drawn clear away from the canal at will. It is highly antiseptic, and quite unirritating. In a bottle it becomes hard, and has to be melted by heat before it can be used, but when melted remains fluid for a convenient length of time.

Classification of Roots for Root Filling.

(1) *Aseptic Roots.*—Those which have never contained putrid material (as where the nerves have recently been killed with arsenic, or have recently died from acute inflammation).

(2) *Septic Roots without complications (gumboil or abscess; gumboil signifying "sinus").*

(3) *Septic Roots without gumboil but with abscess.*

(4) *Septic Roots with gumboil.*

(1) *Aseptic Roots.*—These should be filled as soon as the nerves are thoroughly out, bleeding ceased, and the canals clean, provided there is no arsenic-irritation. If there be, the canal should be left freely open to the saliva until all tenderness has passed away.

(2) *Septic Roots without complications.*—First remove any solid particles of decomposing nerve, or other solid matter from the canal by means of a fine new barbed nerve extractor introducing it little by little, and meanwhile frequently with drawing it, and cleaning away from it any engaged particles, This is to prevent, as far as possible, any pumping caused by driving up any piece of solid matter. Then thoroughly dry out with numerous wisps of dry cotton on fine bristles all the fluid contents of the canal. This is emphatically important and should be thoroughly done before any fluid antiseptic is introduced into the canal, as removing the most efficient cause of inflammation. Next, pass a fluid antiseptic, as far as possible, along the canal on a fine wisp of cotton. The antiseptic recommended is mercuric perchloride in alcohol (1 in 1,000), or pure carbolic acid. Next, except in the case of

unusually large canals, carefully drill out the whole length as far as possible with sterilized probe-pointed Gates' drills, only advancing along the terminal part of the root with a very fine drill, and always avoiding excessively big drills. When using these drills always keep the engine running fast, and press them only gently; never let the engine stop while the drill is in the canal. Now must be decided the question of whether the canals shall be immediately filled. In most cases it would, no doubt, be safe to do so, but in the absence of strong reasons to the contrary, I should put a loose dressing of eucalyptus-oil into the canals, and a temporary cotton and sandarac stopping into the cavity of the crown, reserving the filling of both roots and cavity till another and generally more convenient day, and instructing the patient to take out the temporary stopping if tenderness should occur. On the next occasion, if no serious inflammation be present, and the temporary stopping be still *in situ*, fill the roots and finish the tooth. If the patient were obliged to remove the temporary stopping through tenderness occurring, dress antiseptically again, and renew the temporary stopping, and so continue until the temporary stopping can be retained without discomfort.

(3) *Septic Roots without gumboil but with abscess.*—If an abscess be pointing on the gum, open it with a lancet and so convert the case into one with gumboil. When the abscess cannot be opened externally, treatment is often restricted on the first day with advantage to merely making a drill-hole or opening into the pulp-canal, and so evacuating pus and relieving tension. When the tenderness is not excessive, open up the canals, thoroughly free them completely from debris, disinfect them well, and if pus is freely forming, leave them open to drain, instructing the patient to merely place cotton dipped in say, camphorated spirit, loose into the cavity during meals, and to take it quite out during the intervals, and to

frequently suck the tooth so as to aspirate the pulp-canal If the pus is not forming freely, absorb it all as far as possible with dry wisps of cotton or bristles, then well pump an antiseptic (as creasote) along the canal and proceed in the tentative way described above. Do not fill the root till a temporary stopping has been retained tightly in place for, preferably, as long as a week. Do not use gutta percha as a temporary stopping where the patient cannot remove it.

(4) *Septic roots with gumboil.*—A gumboil being a sinus leading from a putrid pulp canal provides escape for inflammatory exudation, and therefore would prevent any immediate trouble on immediately filling the root, but in order to ensure the healing up of any suppurating cavity which may exist in the jaw, it is better to proceed as follows :—Well open up the cavity of the pulp chamber, rake out the contents of the canals, insert into each canal a loose wisp of cotton dipped in creasote or convey creasote into the cavity, if it be in a lower tooth, by means of conveying forceps. If the blades of the forceps be held together and dipped in fluid, they will hold a good quantity of it like a geometric pen, and will drop it when the blades are allowed to separate. Having filled the canals and pulp cavity with the antiseptic, place a round ball of soft unvulcanised rubber in the cavity, then squeeze the rubber in with the largest ended instrument which can be used until the creasote forces out the contents of the sinus and finally issues itself freely through the gumboil. Repeat this process at intervals of several days until the creasote will no longer pass through, penetrating the gumboil with a probe to break open any superficial healing over ; then permanently fill the roots.

In very long-standing cases there is a large abscess cavity in the jaw, as proved by probing through the gumboil with a silver probe, the roots may as well be filled immediately. Enlarge the orifice of the gumboil with nitric acid, syringe out the cavity through the hole in the gum with an antiseptic and put in a drainage tube, either of small soft rubber tubing or of gutta-percha tissue rolled into the form of a tube. Cut plenty of holes in the sides of the tube. Repeat the syringing at intervals of several days, removing the tube each time and shortening it as the cavity fills up. If it finally refuses to close and the end or ends of the root or roots remain isolated and bare, amputate them with a screw-cut fissure bur.

While the foregoing remarks will be seen to discourage absolute immediate-root-filling, they will be seen to encourage the adoption of all the care and thoroughness of treatment which has been so strenuously advocated by the advanced immediate-root-fillers, and it behoves one to acknowledge fully that their labours and arguments have been of immense service to dental art and science, and though not blindly to be followed in the treatment of every individual case, they have been the means of considerably increasing the general success of root-filling, and shortening the treatment of dead teeth all round. First and foremost among those to whom we are beholden for introducing this new departure into this country, and urging its claims, is George Cunningham, M.A. He has here scored a conspicuous success, viewing the matter broadly.

Before the advent of the immediate root-fillers, dead teeth were approached more or less with fear and trembling, and their treatment was protracted over many weary and unremunerative visits, the very idea of immediate root-filling being looked upon as an absurdity. Now dead teeth have lost most of their terrors and treachery, are approached with a confident feeling, and the number of visits devoted to their treatment may generally be reduced to two.

It is now clear that the main things desirable are to thoroughly and bodily remove all the putrid material from the root without causing inoculation of the pericementum, to disinfect the canal with some potent antiseptic, and to fill it with something permanent and solid; and I think it can be added that in the interest of the patient it is better to wait till the root has had a trial-filling before proceeding to the final stage of the operation.

DENTAL CARIES.

By Mr. J. Snape.

Dental caries is a disease entirely confined to tooth tissues, and is pre-eminently the principal affection that dentists have to deal with. Pathologically it stands by itself, as there is no analogous disease to be found in any other tissue of the body; and in the tissues which most resemble the teeth in structure, namely the hair and nails, there is no special disease to be found which attacks their structure.

The enamel and dentine are both attacked by caries, the latter secondarily, but the more extensively.

Caries attacks the enamel first, and usually in a weak spot, as a fissure, or an imperfectly calcified prism. When commencing in a fissure, it is usually first observed as a dark spot of more or less pigmentation. When on a smooth surface of enamel, as the side of a crown, it appears as an opacity of the enamel, gradually deepening to a brown discolouration.

The disease spreads both vertically and horizontally till the enamel is pierced, when it attacks the dentine. This is destroyed with much greater rapidity than the enamel, the caries spreading under the enamel before it is attacked, and leaving those overhanging edges to the cavity with which we are so familiar, in the preparation of a carious tooth for fill-

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Read before the Students' Society, Liverpool Dental Hospital.

ing. The removal of enamel from the edges of a cavity is principally accomplished by fracture in mastication, and attrition of food, etc. The dentine is softened and disintegrated by the progress of the disease, and removed by similar mechanical agencies, leaving a discoloured pit in the dentine, penetrating more or less deeply towards the pulp. The pigmentation of carious dentine is supposed to be derived from one of the micro-organisms of caries, and usually varies in inverse proportion to the rapidity of the disease, the greatest discolouration accompanying the slowest decay, and *vice versa*. As a rule the less pigmented carious dentine is, the more sensitive it will be found to be on excavation.

The microscopical appearances of carious tissues, dentine especially, are of great importance in determining the nature of the disease.

These are best seen by staining the sections with methyl violet. The enamel will present nearly the appearance of enamel decalcified by the use of mineral acids, showing granular prisms, said by some observers to be adherent to one another, and connected by delicate fibres.

On examining a section of carious dentine, the tubules will be found filled with micro-organisms, chiefly bacilli and micro-cocci which at first enter in single file, increasing till the tubules are packed and beaded by their pressure. This varicosity of the tubules is most marked in the interglobular spaces, where the imperfect calcification of the matrix offers less resistance to the distended tubes. Near the cavity leptothrix is principally found, afterwards bacilli and micro-cocci.

Transverse sections near the cavity show the tubes enlarged and filled with micro-organisms. Irregular spaces or caverns are seen formed by the fusion of two or more tubes together. These are called by Miller "liquefaction foci." In transverse section nearer the normal dentine, the dentinal sheaths are seen to be considerably enlarged. The appearance thus produced has been called the tobacco-pipe appearance of Tomes It can be produced artificially, and is probably due to decalcification of the matrix and isolation of the sheaths.

Sections of carious dentine shew that all parts are not equally infected, the infiltration of the tubules with micro-organisms not proceeding so far as the softening of the dentine. The region of the softened dentine is called by Miller the non-infected zone. In a well calcified tooth, i.e., one with few interglobular spaces, the micro-organisms have a greater tendency to spread towards the pulp than laterally, and consequently the infected and non-infected zones are frequently sharply divided from one another. Nearer still to the pulp, between it and the caries, a transparency of the dentine is noticed. This is called the "translucent zone," and is described by the older writers as investing the caries, and separating it from the normal dentine. It very seldom, however, completely invests the disease, and may be absent altogether. It is best observed in teeth in which the enamel only is attacked, and the dentine perfectly free. It is seen as a cone with its apex towards the pulp, and on its either side will often be seen two opaque lines.

The cause of this is by no means certainly known. The dentine is normally opaque, the opacity being caused by the difference in the refractive indices of the dentinal fibrils and the matrix ; anything which makes these indices equal produces translucency. This is probably brought about either by decalcification of the matrix, or by calcification of the fibrils between the tubes.

The nature of caries has engaged the attention of a large number of observers and has given rise to the production of much controversy and several different theories, a few of the principal of which I propose to review briefly.

The earliest writers on this subject, amongst whom were

Hunter, Cuvier, and Bell, considered that caries was the result of an inflammation of the dentine, arising internally and attaining finally to the surface. The appearances which were supposed to bear out this theory were:—(1) The tobacco pipe appearances of the dentinal tubes in transverse section, supposed to be due to inflammatory thickening of the sheaths.

(2) The Translucent Zone.

This, the "vital theory" later received the support of Neumann and Hertz, but has long been entirely discredited, as similar changes have been effected in teeth out of the mouth thereby precluding the possibility of inflammatory action.

In 1867 Dr. Magitot ascribed the phenomena of caries to the pure chemical action of an abnormal condition of the oral fluids, which having a strong acid reaction, dissolved the mineral constituents of the tooth tissues. This was found to be perfectly true of the first stage of caries, but was inadequate to explain its later phenomena. It was seen in teeth treated with acids that the mineral constituents only were removed, without further change to the organic portion, the dentinal tubes being merely isolated from the matrix, not enlarged, and that the enamel was more affected than the dentine. A year later, Drs. Leber and Rottenstein described the dentinal fibres of carious dentine as being filled with a fungus called leptothrix buccalis, which they claimed was freely discoverable in the oral fluids, round the necks of teeth, etc. Their opinion was that after a breach was formed by the solution of the enamel by acids, the leptothrix attacked the tooth and was principally responsible for the further progress of the disease. This was a great stride towards the views that are held at the present day, but we read that it met with very little attention, and did not displace the purely chemical theory

When the potency of micro-organisms as factors in disease began to be fully recognized, a fresh impetus was given to researches on this subject, which led to the establishment of the septic theory. In 1881, Messrs. Underwood and Milles demonstrated to the International Congress that the most constant feature in dental caries was the presence of certain micro-organisms; that the presence of these organisms caused a fermentative process resulting in excessive acid formation, and that it was impossible to produce caries under aseptic conditions. From these premises they deduced that caries was due to the action of acids, produced by organisms, removing the lime salts, while the organic matrix formed a lodgement and nourishment for the germs themselves.

Miller says in "Micro-organisms of the Mouth" that caries is a "chemico-parasitical process consisting of two distinctly marked stages, decalcification or softening of the tissue, and dissolution of the softened residue. In the case of enamel, however, the second stage is practically wanting.

The acids which cause decalcification of the tooth substances are principally formed from the fermentations of carbo-hydrates or starches and sugars. The principal acid formed is lactic acid. The starches are converted by the ptyalin of the saliva into first grape sugar and then into lactic acid.

The lactic acid first attacks the enamel in its weakest place, as before mentioned, and removes its mineral constituents, forming lactate of lime. As the organic portion of enamel is only about four per cent of the whole mass, the second stage of caries, that which acts upon the organic matrix, does not occur. The organic part disappears by mechanical means as soon as its lime-salts are taken away.

The lime salts of the dentine are removed in the same manner, but as the proportion of organic matter is much larger than in enamel, a second process is necessary for its destruction. This is accomplished by the action of bacteria.

There has been no specific bacterium of caries discovered up to now. The researches of Vignal and Gallippe seem to point to the existence of some such organism. Out of eighteen carious teeth examined by them four different micro-organisms were found in all the cases, a fifth variety in half the cases, and a sixth in five.

The bacteria first crowd up the dentinal tubes. They then dissolve the intervening basis of tooth cartilage,apparently by a similar action to that of the pepsin of the gastric juice, first forming cavernous spaces, liquefaction foci, by the fusion of two or three tubes together, which spread and finally cause liquefaction of the whole mass of dentine in the infected zone.

Dr. Miller has produced artificial decay which is indistinguishable from ordinary caries. He kept teeth in a mixture of bread and saliva at a temperature of 98 deg. Fahr. for three months. He found it necessary to change the mixture daily, as otherwise it became putrid. This gave the mixture an alkaline reaction, which it was found at once stopped the progress of the caries. It has been found that when the putrefaction of albuminous substances, such as meat, takes place, that no acids are formed.

Underwood and Miller failed to produce artificial caries, from a want of appreciation of this fact, as they allowed their mixtures of meat and saliva, etc., to become putrid, and finding that caries did not result, considered it impossible of production.

Caries of dentine sometimes undergoes spontaneous arrest. The causes of this are obscure, but are usually associated with some improvement in the health and surroundings of the patient. The carious dentine becomes as hard as, if not harder than, normal. Microscopically no micro-organisms are to be seen except where caries is recommencing. The disease usually recurs at the line of junction between the sound and the previously affected tissues.

The predisposing causes of caries may be conveniently divided into two classes, the immediate and the remote.

Among the immediate predisposing causes are structural defects, dirty habits, malposition of the teeth, and such diseases as vitiate the oral secretions.

The structural defects favourable to caries are such as the imperfect enamel in honeycombed teeth, or in the sulci of crowns, which deprive the dentine of its natural defence from disease. Also a general deficiency of lime salts and consequent imperfect calcification of the dentine, causing an abnormal amount of interglobular spaces, which favour the rapid progress of caries when it has once penetrated the enamel. Uncleanliness is responsible for a vast number of carious teeth. I saw a short time ago in an Americal Dental journal which has been lately added to the papers in our Students' Room, an account of a Transatlantic dentist who had printed on all his bills "Clean teeth never decay," with which inscription he proudly confronted any patient who thought his fees excessive. Without going to this length, I think that a more thorough attention to oral hygiene than at present prevails would result in a great diminution of the number of decayed teeth.

Such conditions as rheumatism, stomatitis, dyspepsia, pregnancy, and the exanthemata cause an acid condition of the oral secretions and cause them to dissolve enamel which would have resisted the saliva in its normal condition.

Mal-position of the teeth causing over-crowding, or the existence of unnatural spaces between the teeth, which become filled with food which is retained and ferments in close opposition with the enamel. This retention of fermenting substances is also particularly favoured by bridge-work, ill-fitting crowns, or artificial plates which are not frequently removed and cleaned.

The more remote predisposing causes are principally the effects of a civilization which, while refining and improving the minds and modes of living of its children, appears to do so at the expense of their physical constitutions. The use of cooked food, by lessening the amount and difficulty of mastication, has resulted in a corresponding diminution of strength and durability of our dentition in obedience to the law of adaptive modification.

Further, we must recognise the preservation, by science, of the lives of many tuberculous, syphilitic, and rickety children who live to transmit their ruined constitutions to their offspring; and hereditary influence is strongly marked in many cases of caries as in other oral irregularities and complaints. Occupation may also influence the occurrence of caries. Bakers and millers are especially liable to this disease, and the teeth of alkali workers, which are exposed to the fumes of acids during the process of manufacture, are said to become blackened and to decay rapidly.

The class of food exerts an indirect influence, due to, and depending on its liability to undergo fermentation. Meat eating tribes are found to be free from caries, while those whose food consists chiefly of carbo-hydrates suffer severely.

INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

The preliminary arrangements of the eighth International Congress of Hygiene and Demography, to be held at Budapest from the 1st to the 9th of September this year, are already far advanced. As many as 440 papers are already promised by foreign scientists. The interest of the Congress will be enhanced by the circumstance that the medical officers of the German railways and the cremation societies will hold their meetings at Budapest in connection with the Congress. The Congress will be opened by His Imperial and Royal Highness Archduke Charles Louis, and the introductory meeting will take place in the Building and Garden of the National Museum.

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THE TEETH IN TABES.

Tabes is also known by the name of Locomotor Ataxy, and the lesion which gives rise to this disease is localised mainly in the posterior columns of the spinal cord. The complaint sets in insidiously, and runs a very chronic course, but when fully developed the symptoms are very marked; the staggering and uncertain gait are characteristic. They are due to the inability to co-ordinate the action of the muscles of the legs, and the muscular sense is impaired. Later on, and during the progress of the disease, other painful symptoms become manifested.

In the February number of *L'Odontologie*, Doctors Lemaire and Albert Bernard contribute a paper upon the dental affections which occur during Tabes. They think it is generally admitted that the nutrition of the teeth may be affected during the development of disease of the nervous system. It is therefore not surprising that the dental system should not escape in the case of Tabes, which "in its pitiless march, spares no function of the organism." These authors first allude to several cases reported many years ago, before Tabes was so well understood as it is to-day. These observations were simply presented as peculiar cases, or pathological curiosities, and dealt with a singular affection of the dental arches and alveoli, characterised by a gradual and progressive destruction of the alveolar margins. Although the teeth were healthy they became loose and fell out successively, without pain and almost without hæmorrhage. It is also noted that the gums, like the teeth, were healthy ; so that this would seem to prevent our making suggestions about Pyorrhœa Alveolaris. Doctors Lemarie and Bernard, however, do not care to rely upon these ancient instances, but give a clear account of two cases, recorded by Professor Vallin in 1879, in which all the teeth were successively lost without any local cause being apparent. The onset of this complication occurred in the one case during the seventh year of the Tabes, in the other after three years. In 1882, Professor Demange recorded two more cases which are especially important inasmuch as there is an account of the post-mortem examinations. In the first instance, the patient about the fifteenth year of the disease lost all the teeth in the upper jaw in less than two months. They became loose and came out painlessly. At the necropsy a distinct sclerosis of the fifth pair of nerves was found, along with atrophy of the bulbar origin. In the second case teeth were also lost at the fifteenth year, but only those in the left upper jaw were affected. They became loose and fell out in a month. Both trigeminal nerves were found diminished in volume and atrophied, especially the left, which was scarcely recognisable. The corresponding Gasserian ganglion was completely atrophied. M. Demange thinks that the trophic influence of the Trigeminal affects the dental system in the course of Tabes. An osseous rarefication is produced at the alveolar border in consequence of which the tooth in some way spontaneously leaves its socket. Our authors draw attention to a few other cases and, in the course of some interesting remarks, point out that every tabetic patient who suffers with trouble of trigeminal innervation is not destined to lose his teeth. But when they are lost there will certainly be some sensory disturbance which is the precursor of the trophic trouble producing the dental condition. When, after such a premonitory stage, the teeth disappear, there is a complete absence of any other cause. The patients accidentally discover that their teeth are loose. The principal features of this tabetic occurrence are—the absence of pain ; the rapidity with which the tooth is shed without dental periostitis or the least trace of gingivitis ; and the absolutely intact condition of the tooth itself.

It is well-known that teeth are lost in much the same way in other constitutional states. There is not much to be said as to treatment, but the dentist can come to the aid of the physician, and, by means of an artificial denture, help to make the patient's life more bearable.

Infection from the Mouth.—In addition to the half-dozen forms of micro-organisms normally present in the mouth, bacteriologists teach us that many others, some of them pathogenic, may be found. The newspapers have recently reported the death of a dentist in Berlin from septic infection. During the extraction of a tooth, the patient bit the operator's finger. Some hours later, symptoms of blood poisoning became manifest, delirium set in, and there was a fatal result. Few dentists can avoid occasional abrasions of the skin, and it is well to remember that it is not necessary for a patient to make the wound as well as to supply the infective material. Leaving on one side the question as to whether saliva is, or is not, poisonous, there is another source of infection which is perhaps too much overlooked, although fortunately but few cases, comparatively, seem actually to produce serious results. The presence of mucous patches is a distinct element of danger in a patient's mouth. Cases have been recorded which prove the necessity for great care in the sterilisation of instruments after use in such a mouth.

Another substitute for Iodoform.—Amongst the objections raised to the use of iodoform in the mouth, that of its odour is perhaps the one which is of greatest weight. Professor Miller has shown us preparations in which micro-organisms were to be seen thriving upon a crystal of the drug, but clinical experience has, we believe, led to the continued use of iodoform. In larger quantities than dentists are likely to employ, toxic effects are not unknown, and this is an additional reason for the introduction of many proposed substitutes. The latest is Thioform, a basic bismuth salt of dithiosalicylic acid. Sulphur, and not iodine, is the characteristic component of the preparation, and it is said to be odourless, non-toxic, and of greater antiseptic strength than iodoform. The bismuth present is stated to give it a desiccative action.

GASTROTOMY FOR THE RECOVERY OF A DENTURE.—Several cases have recently been recorded in which artificial dentures have passed through the fauces. Mr. David Wallace reports in the *Lancet* an extremely interesting instance of a plate with five teeth becoming impacted in the gullet. Œsophagotomy was performed, the opening being made as low down as possible, but the plate could not be grasped. An incision was therefore made in the abdomen, and afterwards an opening in the stomach large enough to admit the operator's hand. A forefinger passed into the œsophagus reached the foreign body an inch and a half from the orifice, and the plate was withdrawn with a dressing forceps. The patient who was nursing twins before the operation, had an attack of mania afterwards, but ultimately made a good recovery. Mr. Wallace makes some valuable remarks upon the treatment for the removal of foreign bodies from the œsophagus.

THE RECENT DEATH UNDER NITROUS OXIDE.—Mr. Adams, who administered the gas in this case, has read a paper before the Society of Anæsthetists containing a detailed description of the occurrence. It seems that the patient removed the face-piece after three or four inspirations, and said he felt nervous. At his own request the administration was proceeded with. After taking about two-thirds of the ordinary quantity of gas, the right upper second molar was extracted easily. The respirations at once became irregular and, after three or four, stopped; there was cyanosis and rigidity of muscles. The mouth-prop was at once removed, the tongue was pulled forward, and artificial respiration commenced within thirty seconds from the extraction. Other treatment consisted of nitrite of amyl within one minute, injection of ether within two minutes, and tracheotomy within three minutes of cessation of breathing. After two minutes two or three expirations took place, but although artificial respiration was kept up for twenty minutes there was no response. The only explanation Mr. Adams can offer is that there must have been some special circumstances in the patient's organism which made the temporary asphyxia from gas specially liable to pass into a fatal form.

INFRINGING THE ACT.—We publish elsewhere an account of the successful prosecution of an unregistered man, in which the use of the word "dentorium" has been held to contravene the wording of Clause 3. We have so recently drawn attention once more to the power this clause confers, that we now only remind ourselves that the way to make use of it was shown us by the Royal College of Veterinary Surgeons. This Body has just proceeded against another offender, at Derby, who employed the term "veterinarian," although not upon the register of veterinary surgeons. According to the statement of the counsel for the prosecution, "Webster's Dictionary" brought the defendant within reach of the Act. The veterinarian had been frequently warned as to the use of this title, but he seems to have set the College at defiance. The magistrate inflicted a fine of £1 and costs.

OPERATION FOR TRIGEMINAL NEURALGIA.—A case of intractable neuralgia is reported by Keineking in the *International Medical Magazine.* The patient was an otherwise healthy farmer aged sixty-three, and the ophthalmic and maxillary branches of the nerve were the ones principally affected. An incision was made along the eyebrow, and the supraorbital nerve separated from its surroundings as far back as possible. Some of the finer branches of distribution to the forehead were dissected out and removed and then the trunk was seized with forceps and slowly twisted until it gave way on slight traction being made. The infraorbital nerve was treated in much the same way by removal of the roof of the bony canal with the chisel. There was pain for about three days after the operation, but it then entirely disappeared and has not returned since the operation some two years ago. It is considered that the slow tension of the nerve destroys the function for some distance beyond the point where it is grasped.

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ANOTHER SCHOOL DENTAL APPOINTMENT.—The Hackney Board of Guardians have been advertising their intention to appoint a dentist. He will be expected to stop, scale, extract, and regulate the school children's teeth and will receive a salary of £100 per annum. For this he will have to provide the necessary materials, and, in the language of the advertisement, the "plant." Nothing is said as to keeping records of the work done, nor as to the presenting of monthly statements and an Annual Report to the Board. These things should be done in order to make the appointment analogous to that of the Medical Officer. We notice that during the visit paid by a Local Government Board Inspector to the West Derby Guardians, he drew attention first to the fact that no arrangements appeared to exist to ensure the use by the children of private Prayer Books in the different houses, and then spoke of the desirability of having some care taken and a regular inspection made respecting the children's teeth. If "Cleanliness is next to Godliness" may we not say, "The Tooth-brush is next to the Prayer-Book?"

THE DENTAL HOSPITAL OF LONDON.—The thirty-sixth annual meeting of this institution was held at the hospital in Leicester Square, on March 15th, under the presidency of Mr. J. Smith Turner, the vice-president. The annual report having been adopted, the chairman called attention to the satisfactory report for the year 1893. He urged very strongly the claims of the proposed new hospital, pointing out that from the sanitary and overcrowded state of the building, a new hospital was much needed; he further called attention to the great value of the institution as a teaching centre, from which excellently equipped dental surgeons are turned out, so that the institution was valuable, both as a charity and an educational establishment, and deserved therefore the hearty support of the public. Towards the £40,000 required for the new building, £9700 had been promised or collected; of this sum £2000 only had been contributed by the public, the remainder having been subscribed by the dental profession. The chairman ventured to think this should not be, and that the public should contribute more liberally towards so useful and deserving an object. During the meeting a cheque for £500 was handed in from Mr. Henry Harben, as a donation to the new hospital building fund.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary monthly meeting, February 5th, 1894. Mr. Frederick Canton, M.R.C.S., L.R.C.P., L.S.A., L.D.S., President in the chair.

The Minutes of the last meeting were read and confirmed.

The Curator, on behalf of Mr. Norman, a student of the Dental Hospital of London, presented to the Museum an interesting specimen of dilaceration of the right upper central incisor. The tooth, he said, presumably was injured at the time the child was two years of age. On one occasion, climbing up on to a table, he slipped and struck his face with considerable force, cutting the upper lip with his temporary tooth ; so much so as to necessitate the interposition of a surgeon to sew it up. As time went on, and he cut his permanent teeth, it was seen that the right upper central incisor was considerably damaged, and at the age of 16 it got so loose that it came under Mr. Norman's observation at Poplar Hospital, and was extracted. On examination it would be seen what an immense amount of bending and laceration must have taken place, and how large an amount of new tissue had been thrown out to unite the injured portions. At the same time it was very remarkable that so slight an amount of damage had been done to the succeeding portion of enamel that had been developed. He intended to make a section to see the condition of the pulp cavity, and if possible, to get a section right through the middle for microscopical examination.

Mr. Storer Bennett said some ten years ago he had three patients under his treatment in the Dental Hospital—two brothers and a sister, aged respectively 12, 11 and 10. They were suffering from superior protrusion, and were under treatment for some time deriving considerable benefit, but then passed away from his ken, as was unfortunately the way with so many hospital patients. Last year a child, 12 years of age was brought to him who turned out to be a younger sister of this same family. At the time the original cases were under treatment he took models of the mouths and presented them to the Museum. He was so interested in the fourth child coming up that he got the mother to induce the children, who ad then grown up, to let him see the present condition of their mouths and to take models. He also obtained photograph of the children from the age of 6 upwards, and they were interesting as showing that even as early as that, certain peculiarities could be traced about the face that might be of value in suggesting permanent treatment before protrusion of the front upper teeth took place, and so preventing the abnormality occurring to so large an extent as unfortunately happened in the case of these children. The family history was also interesting, because the condition of superior protrusion affected the maternal grandfather, and then seemed to have skipped a generation, neither the father nor mother of the children having the slightest tendency to it. In the case of the boys the treatment was effectual in reducing the abnormality to a considerable extent, but unfortunately in the case of the girl, she gave up the use of the retention plate prematurely, and the mischief had returned to a worse extent than in the other two. He thought that if it could be recognized at an early age of a child, from the appearance of the lip and the hereditary condition of the family, that superior protrusion was almost inevitable in the mouth, it would be not only justifiable, but advisable to remove the first temporary molars and, thrusting the forceps well up into the socket, to remove the developing first bicuspid, in order to prevent a malformation which was very difficult to cure.

Mr. F. J. Bennett exhibited two sets of models, the first being from a lady aged about 30, and who had worn an upper plate for seven years previous to the time of taking the models. Superior protrusion had occurred, and an impression taken with the plate in the mouth gave the exact measure of that protrusion from $\frac{1}{6}$ to $\frac{1}{8}$ inch, during the seven years since the plate was first made. A great additional interest arose from the fact that the bite was underhung, and it showed therefore that three at least of the commonly ascribed causes of superior protrusion were absent, namely, the pressure of the incisors against the upper teeth or the gum behind them, and secondly the absence of any pressure by the lower lip on the back of the upper teeth ; and thirdly, the shape of the plate and its band prevented any driving forward of the front teeth by pressure from the back ones.

The second case illustrated superior protrusion due to the loss of the back teeth, in a patient of 83. The points of interest were the complete adaptation which had taken place at this advanced age. The patient was hale, and the teeth quite firm, but the upper ones had been gradually driven forward, and the lower front ones fitted into depressions which they had made in the gums behind the upper teeth. The cutting edges of the incisors were worn by erosion not by attrition.

Mr. William Hern related an interesting case of multiple "dentigerous cysts," occurring in a patient, a boy aged 9. He said the case was interesting, both from its rarity as well as from other collateral points. The little boy was first seen in February, 1893, by his colleague Mr. Matheson, and he regretted that he was not present that evening to give his own account of the case. Mr. Matheson transferred the patient to Mr. Hern for surgical treatment in the Middlesex Hospital.

Present state, Feb., 1893.—The right side of the face shows marked bulging in the malar region; there is also some swelling of the left side of the face, but not so marked. On examining the mouth, there is a fluctuating painless swelling occupying the right alveolar region above the teeth. The swelling extends from the right central incisor to the region of the first molar, and is as large as an elongated pigeon's egg. On the outer surface of the left alveolar ridge another painless fluctuating swelling can be detected about the size of an almond; this swelling is situated about half an inch above the teeth on the outer alveolar surface. On passing the finger backwards from this swelling, two or three hard bony prominences can be felt, suggesting to the touch the cusps of unerupted teeth.

The teeth present in the upper jaw are:—right and left permanent central incisors; right and left temporary lateral incisors; right and left temporary canines; first and second right upper bicuspids; first right and left permanent molars.

On examining the lower jaw a small elastic, fluctuating swelling, as large as a flattened Barcelona nut, is also found occupying the front surface of the alveolus on the left side, between the left permanent lateral incisor and the left first temporary molar in the region of the unerupted canine tooth.

It was decided that it was a case in which surgical interference was desirable for the cysts in the upper jaw, and the lad was taken to Mr. Pearce Gould, who was present this evening, and who would kindly tell them the nature of the operation he suggested and carried out.

The cysts were opened by Mr. Pearce Gould. On the floor of the right upper cyst a lateral incisor tooth was found lying almost horizontally, with its crown directed forwards and outwards; it was decided to leave this tooth and give it a chance to erupt. The right temporary lateral incisor was extracted.

On opening the left upper cyst a lateral incisor tooth was seen deeply placed, with its crown projecting through the roof of the cavity in an almost vertical direction, but with a slight backward inclination; this also was left.

Mr. Hern took models of the mouth and the teeth *in situ*. The small cyst in the lower jaw on the left side was not touched.

February 3, 1894.—The patient was seen, and the incisor tooth, which had been left in the floor of the cyst on the right side, was erupted to the extent of one-third of its crown, but its direction was so horizontal that Mr. Hern thought it advisable to remove it.

The tooth was placed in the position on the model taken last year, and a plaster cast procured. (This was shown).

Mr. Hern mentioned the following points of interest in the case:—

(1) The cysts were multiple. As far as he was aware no previous case of multiple dentigerous cyst in the human subject had been recorded; indeed the statement made in text books was that they were always single.

(2) The bilateral symmetry of the cysts in the upper jaw; the cysts occurring on each side in connection with the permanent lateral incisor tooth. It is interesting to note that Mr. Sutton has noticed this bilateral symmetry to occur in the lower animals affected by the same pathological condition—notably in goats.

(3) The mischief caused to the jaw and teeth by these tumours seems to be in proportion to their depth from the surface and contiguity to a pre-existing cavity, like the antrum, to which they could spread. The cyst occurring in the lower jaw having come to the surface and burst, was self-cured, without any disturbance to the left permanent canine, with which it was connected, that tooth having, as shown in the model, now assumed its normal position in the arch; whereas the pressure of the expanding cyst on the developing left bicuspids had led to such deviation in their direction that the crowns pointed inwards and their buccal surfaces were opposed to the bite of the lower teeth.

(4) The models of this case, taken in February, 1893-94, show an interesting fact in regard to eruption, viz., that a tooth which has been disturbed in the jaw having been bared to five-sixths of its length and one half of its circumference,

retains, nevertheless, a tendency to erupt. The right permanent lateral incisor, which is seen in the first model embedded in the floor of the cyst, is seen in the second (taken twelve months after) to have moved forward nearly half an inch, and to be erupted to the extent of half its crown.

Mr. Pearce Gould explained the nature of the operation. The mucous membrane was cut and then the cyst wall opened. The cyst was not enucleated in a body, but in several pieces. The same method was followed with the next larger cyst. When the first cyst was opened, the permanent lateral incisor was at once observed lying horizontally and deep in the cyst, as shown in the model. The points of the case, which interested him as a surgeon—and he spoke with all humility before a society of dentists—was the fact that the wound entirely healed up without removing the tooth. He had always been taught that the proper treatment of dentigerous cysts was to open the cysts andremove the teeth. His own feeling was, in every case where possible, to remove the cyst wall, and this he did in this instance ; and he might say that in spite of his leaving the tooth there, the whole cavity had healed up. The same thing happened on the left side; but there was this difference, that on the right side the tooth had erupted, while on the left it had not yet doneso. Then the smallest cyst of all, which he left alone, entirely disappeared when the tooth had erupted. The question occurred to him, how far nature might be left to do its own beneficent work in some of these cases.

Mr. F. J. Bennett said he was extremely interested in the progress of this case. He had been a little sceptical as to any conservative result from the treatment, but he thought Mr. Gould was deserving of great praise for carrying through this operation. It was the very essence of conservative dentistry to be able to destroy the cyst wall and to bring down the tooth, regulating it so as to make a complete cure. With regard to Mr. Sutton's classification of odontomes, no doubt he took a very broad scientific view of tooth tumours, and proposed not only to include hard tumours, either in dentine, enamel, or cementum, but also the soft tissues, which went to form either follicle or any part belonging to the tooth structure. This applied more especially to the multiple contents of the cysts in which the tooth, in a soft condition, was broken up by the pressure of fluid and became a series of denticles. If this was to be considered as an odontome, they should include also all retained teeth, because it was only a question as to whether the fluid which naturally existed between the enamel organ and the capsule accumulated in large amount and formed an obvious cyst, or whether it dried up and they simply got the hard portion of the tooth retained and called it a retained tooth. If this was to be called an odontome, they must apply the same term to a retained tooth, for there was no hard-and-fast distinction between a retained tooth and a dentigerous cyst containing a perfect tooth, in which there was a large amount of fluid. There was a certain amount of fluid in any retained tooth, although it dried up.

Mr. J. F. **Colyer** mentioned the case of a patient who came to the hospital some months ago with extensive destruction of the upper and lower front teeth. The man was engaged in testing sugar boiling for confectionery purposes. This was done by means of the teeth, and as a result of his occupation, very marked destruction had ensued. The incisors were level with the gum; the canines were standing, but were extensively destroyed at the gum margin. In the lower jaw there was also extensive destruction from the second bicuspid on the one side to the second bicuspid on the other. The man stated that the teeth first commenced to decay at the gum margin, gradually corroded away, and broke off. The majority of the teeth seemed to be wearing away. In many of them the decay was quite hard, having reached the condition sometimes called "arrested decay." He had since had the opportunity of seeing a patient engaged in a similar business. There was extensive decay in every tooth, and there also it appeared to commence at the gum margin. The case was worth the inspection of those interested in such matters.

Mr. **Baldwin** then spoke on "Root-filling." His remarks are published at page 298.

The discussion was adjourned to the April meeting.

Mr. **George Brunton** exhibited specimens of a substance named carborundum, from which wheels for engines and powders for grinding and polishing teeth had been produced. It was not a natural substance, and its chemical formula was SiC. Its hardness was between that of the ruby and diamond. It was produced by mixing sand and charcoal dust, putting them into a furnace into which carbon points protruded, connected with a dynamo. The electric current was kept up until the mass crystallised. The silicon crystallised and took up a little of the carbon. After cooling, it was subjected to acid washings to remove the soluble portions, and the mass was crushed. Microscopic sections of the crystals were exhibited.

Mr. Brunton, in reply to a question, said there was no toughness about the material. The specimens of wheels were baked porcelain with the added carborundum, and were therefore brittle. They would not bend.

PRESIDENT'S INAUGURAL ADDRESS.

Gentlemen,—My first duty on taking this chair is to acknowledge the honour you have conferred on me by electing me your President for the ensuing year, and at the same time to assure you that I will use my best endeavours to promote the welfare of this old and honourable Society.

When present, a short time ago, at the Annual Dinner of the Harveian Society, I was struck with a few remarks which fell from the President of that Society. He stated that in 1880 there were 14 Medical Societies in London, and that in 1893 there were no less than 28. This statement he followed up by an earnest wish that some kind of Royal Academy of Medicine might be established, which would incorporate in some form, into one body, these 28 Societies, for, as he truly remarked, at the present time there was no " one body," so to speak, that the public could turn to for an authoritative answer to any question concerning the public welfare.

Another speaker later on the same evening stated that he was not a member of the Harveian Society, because there were only six evenings in a working week available for attending meetings, and these were already more than filled up.

Now, gentlemen, we have a good deal, I think, to be thankful for in this respect, for in London, (not counting student Societies), we have only two Dental Societies, viz., this, the Odontological Society of Great Britain, and the Metropolitan Branch of the British Dental Association; the former now confines itself exclusively to science, the latter taking science and dental politics also; another Society was started some time ago, but came, I think, very soon to an end.

Our earnest endeavours should be to make this Society as popular as possible, by making our evenings interesting and instructive to the generality of members, and so give no excuse for another Society to be started in opposition to this. Our specialty being a branch of general surgery, is another reason why we should only have one Society in London.

A Society like this not only does good by disseminating knowledge gained by experience from one to another, but does a great deal of good in a social way in bringing members of our profession together to know each other well, and by so doing to strengthen the profession as a body. It also reminds us that we are in a manner the guardians of the true professional spirit, which we desire to see more and more permeating our ranks.

The pressure of trade influences is powerful, and their operations are but little understood by the public, until something occurs which brings suffering to the body or the purse, or to both, while the apparent, and it may be temporary success of trade methods has a strong fascination for young men in haste to get into full practice.

The Bye-laws of this Society strictly suppress all such unprofessional methods of procedure, and its membership is a guarantee that its individual units seek in every way to act in a truly professional manner to their colleagues, and to the public at large.

Our frequent meetings tend to confirm and support the members in their honourable resolves, and to help those who are commencing practice to tide over what must of necessity appear to them the hopeless part of their career, and save them from slipping into a lower sphere, from which familiarity and habit may deprive them of any desire to extricate themselves.

I am not sure that it would not be a good plan to follow the course pursued by many other societies, and establish an Annual Dinner; by doing so we should be able to ask a few distinguished persons each year to become our guests, and enable us also to bring our Society more into notice, and in this way very likely help to increase the number of our members, and in the course of my year of office I propose bringing this question before the Council for its consideration.

At the Annual Meeting held last month it was decided for various reasons to alter the date of our Annual Meetings from January to June, and in order to carry out this arrangement, I am, I believe, to hold office rather longer than usual; such being the case, it will necessitate, with the help of the secretaries, my furnishing matter for more than the usual evenings allotted to a President; and as I am one of those rather against asking our medical friends to come and entertain us by reading papers before us, I trust that members of the Society will lend me a willing hand in my endeavours to supply useful and interesting evenings, by not waiting to be asked, but by coming forward and offering anything they may have of an interesting nature to bring before us, either in the form of a paper or casual communication.

I am very much of opinion myself that most instructive evenings can be passed by discussions on ordinary subjects occurring to us for treatment in our daily practice, and I purpose to adopt this course whenever we are short of a paper, instead of going outside our ranks for help ; at the same time I would not have it thought for one moment that I do not appreciate the kindness of our medical friends in coming forward with papers, but I think that unless such papers are of special interest, and have a direct bearing on our specialty, this Society should be able to provide plenty of interesting matters from among its own members.

I shall be very glad if individual members of the Society will communicate with me and suggest any subjects for discussion that they think would be of special interest, and with the help of the secretaries I would then endeavour to organise a good discussion on whatever subject might be selected.

At the present time there are, I believe, 367 members of the Society, consisting of 157 London, 175 country, and 35 honorary and corresponding members. Considering the number of good practitioners there are in London and in provinces, this is not quite a satisfactory number, and I think the Council might well consider in what way we could bring the Society and its advantages more under the notice of practitioners, with a view of getting them to join. I am glad to see that there is a good list of new members to start our year with. Another question concerning this Society which I should like just to mention, is the question whether we should not create the office of President-elect. I myself have not been a member of the Council now for some two or three years, or perhaps more, and I have felt it a little awkward suddenly to be called to take the post of President without in the least knowing what subjects of interest have been lately before the Council, and I intend asking the Council, among other things, to consider this matter, as it would avoid the little difficulty which I, and no doubt others, have felt.

One reason that I have heard mentioned why London practitioners do not join the Society is that the subscription is £2 2s., but I cannot believe that this can really be a strong reason, for it must be remembered that the majority of our members are not called upon to join our medical societies as well, and if we recollect the transactions which are published, and which are not issued by many medical societies, I do not think the subscription can be considered too high; added to which we must always bear in mind the fact that we may have to separate some day from our connection with the Dental Hospital, and may have to build or buy a home for ourselves, and this has always been considered by our careful and prudent predecessors, and made them almost from the first put by for a rainy day; there are also other reasons one could urge for still putting by.

I myself should much like to see the Society in more commodious rooms; at the same time, for very many reasons, I should be sorry that we should separate our connection with the Dental Hospital, and if the authorities can, before very long, see their way to building a new hospital, as I sincerely hope they may, I have no doubt they will do much to try and keep us still with them and endeavour to provide us with good accommodation; therefore for the present, if hospital authorities can see their way to keep us, I think, taking all things into consideration, it is to our interest to stay. The principal things to keep in view in whatever changes take place, are that we shall have a commodious and comfortable meeting room, also a fitting home for our museum and library, and that we shall be able to make such arrangements as shall make them, under certain conditions, accessible to the whole profession at all reasonable times, and if possible, a reading and, may I suggest, a smoking room and a physiological laboratory for the use of members.

I need hardly say that none of these things belong to us now, but we may all hope that in the pending changes which now cast their shadows before, such improvements may be accomplished. Some few years ago, Dr. Walker, when President of this Society, threw out suggestions of a similar nature; may he yet live so see them accomplished.

STUDENTS' SOCIETY, VICTORIA DENTAL HOSPITAL, MANCHESTER.

Fifth General Meeting, Tuesday, February 27th, 1894. The President, Mr. F. W. Minshall, in the chair. The minutes of the previous meeting were read and confirmed.

Casual Communications.

The President passed round the following :—

1. A model of an upper maxilla, the left upper bicuspid of which was of curious character. There was a considerable cavity situated mesially and encroaching on the coronal surface. Mr. Minshall in explaining the case, said that it was not a case of caries, which examination of the model alone would leave the observer to infer.

2. Model of a lower jaw with an epulis in the left molar region. The patient had had a tooth (six year molar) extracted some time previously.

3. A model showing a typical case of adhesion, from ulceration caused by persistence of temporary roots.

Question Box.

The following questions were brought before the meeting for consideration, but owing to the shortness of time allotted to them, were inadequately discussed.

1. Is a collar necessary in crowning an incisor root.

Mr. J. P. Headridge considered that a collar was requisite in some cases, while in others it was not needed. If a crown had to be made for a close bite, or in some portion where a great strain would be imposed on it, such as at the angle of the mouth, a collar would more effectually secure its absence of movement. In other cases he thought it was scarcely worth the trouble and time involved.

Mr. Dougan was of opinion that the cases which most needed a collar crown, were those cases in which a well-adjusted collar required great care and time in fitting. Of such examples were roots decayed beyond the margins of the alveolus. He had inserted a large number of crowns for these cases by the following method. A plate was made to cover the front part of the root, and a tooth and pin fitted and soldered. A small piece of wax should now be placed over that part of the pin and tooth intended to be placed over the root, and whilst still soft placed in position in the mouth. When withdrawn an accurate impression of the root is obtained. Replace the wax with vulcanite in the ordinary way and insert. He contended that a better fit would be obtained in this manner than by using plate alone.

Mr. P. A. Linnell and Mr. D. Headridge both advocated the ordinary pivots.

Mr. Minshall admitted that a collar was not always necessary, although he himself invariably used them, and had never regretted putting on a collar. He thought that the increased stability obtained, and the reduced liability of the cement being dissolved, were worth the trouble required.

(2) What is the effect on the teeth in division of the 5th nerve.

Mr. D. HEADRIDGE suggested that division of the 5th would produce changes in the periosteum resulting in loss of the teeth. The gum also would assume a glassy hue, owing to diminished nutrition of the tissues.

The gentlemen who followed Mr. Headridge apparently lost sight of the intentions of the author of the question so by unanimous consent of the meeting the question was left open for discussion at some future meeting.

The most interesting event of the evening was the demonstration on "Continuous Gum Work," by Messrs. SIMMS and HOUGHTON. The whole process was shown from the laying on of the body to the completed case. The demonstration was eagerly watched by groups of the students, who followed the preparation of the cases very carefully, evincing their interest by the numerous questions addressed to the demonstrators. Two cases were fired, and the results obtained were all that could be desired.

At the close of the demonstration a vote of thanks was unanimously carried for the kindness displayed by these gentlemen in coming forward to give such an instructive demonstration.

The meeting then terminated.

Dental News.

PROSECUTION AT BARROW UNDER THE DENTISTS' ACT.

George Fred. Bamber was charged with, not being registered under the Dentists' Act, 1878, and with using the description "Free Dentorium," thereby implying that he was registered under the Act or that he was a person specially qualified to practise dentistry and not being a legally qualified medical practitioner. Mr. Darcy (instructed by Mr. J. Park) conducted the prosecution, and Mr. W. Williams defended.

Mr. Darcy said the summons was taken out under the 3rd section of the Dentists' Act of 1878, 41 and 42 Victoria chapter 33, and it was to the effect that from the 1st of August, 1879, persons should not be entitled to take the name or title of dentist alone or in conjunction with other words, or use the term dental practitioner, which should imply that the said persons were registered under the Act, unless the persons were qualified dentists under the Act, and that under another Act (1888) a private practitioner was permitted to prosecute in case the original Act was infringed. Those Acts were most important and beneficent ones. They were to see that men were qualified and went through a *curriculum* to make themselves efficient in a certain branch of science. They were also beneficent in protecting the public against those who were not qualified men. The defendant was a young man who carried on business at 217, Dalton Road, Barrow, and occupied the first floor of that building for his practice. He advertised largely, and over the shop there was a sign setting out that the place was a "free dentorium." He was not, however, registered under the Acts he had quoted. He asked that a suitable penalty might be imposed.

Simeon Siddaway said he was the owner of the place occupied by Mr. Bamber, who had the premises on a monthly tenancy. He had occupied the place 18 or 19 months.

Cross-examined: The premises were occupied before by Mr. Lacy, who practised there as a dentist under the name of Park and Co. The name Park and Co. was in the window before defendant took the place. He believed the words "Free Dentorium" were there at that time. He could not swear to that, because he had not carefully observed it.

John Davis said he was a member of the firm of Davis and Sons, photographers, and had photographed the premises occupied by the defendant. The photo produced was the one he had taken on the 7th March, 1894.

Charles Grevile said he was a dentist in Barrow and was the plaintiff in the present case. He was a qualified man.

Cross-examined: He was registered on September 26, 1878.

He had practised in Pendleton before 1878. He would be about 15 or 16 years old when he commenced his dental career. He had been a dentist in Sidney and San Francisco.

He came to Barrow about ten years ago. He did not at once begin practice on his own account. He went with Mr. Chapman. He did not enter into any undertaking to enter into any opposition to him. He did not start in opposition nor in conjunction with him. He did not call it opposition to commence business on his own account. He advertised his business, most dentists advertised. Those who were registered announced the same on their bills and in their advertisements. That indicated that they were registered under the Act. No person was entitled to use the words "free dentorium" unless he was registered under that Act.

Bills were then handed to the witness which had been issued by a Mr. Park, who had been in his employ, and he believed they were the same as were produced at the proceedings he took against Park. He had not received notice to produce them that morning. He had not requested Mr. Bamber to remove the words "Free Dentorium" from his windows. He had seen the words on the windows several months. He had allowed the words to be used without protest. The words "Free Dentorium" were unique in his experience, and he had not seen Mr. Macdonald's advertisement in Manchester.

Charles Roberts said he was a commission agent, and spoke to several advertisements issued by the defendent.

Sergeant-Instructor William Flannigan, called, said he had had teeth extracted and new ones put in by defendant, which had always been satisfactory. He had paid for what he had done.

Cross-examined: He had visited Mr. Bamber's place through seeing the advertisement in the papers.

Frederick Spice gave similar evidence.

Leonard Parker Chapman, a Town Councellor of Barrow, spoke to defendant having served his apprenticeship with him as a chemist and druggist. Defendant had never passed any examination with him.

That being the case for the prosecution.

Mr. Williams submitted there was no case, and quoted from the Act to support his contention. The Action was under the Summary Jurisdiction Act, which said that cases of that character must be gone on with six months after the cause of contention was first discovered, and he submitted that Mr.

Grevile had known of the action of his client some eight or ten months before he took out the summons.

Some argument here occurred, and it was decided that the Clerk should make a note of Mr. Williams's point.

Continuing, Mr. Williams advocated that his client had never set forth that he was a qualified dentist, and that the words "Free Dentorium" might mean anything. He had carefully abstained from calling into requisition any words or terms which might implicate him.

No witnesses were called for the defence.

Defendant was fined £2 and costs.

To Correspondents.

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PENTAL.*

By T. E. Constant, L.R.C.P.Lond., M.R.C.S., L.D.S.Eng.

Mr. President and Gentlemen,—In bringing to your notice this evening a new drug for the production of general anæsthesia I am not acting without precedent, because so long ago as 1870 Mr. Woodhouse Braine exhibited at a meeting of this Society, an anæsthetic that was then in its infancy. Nevertheless, it was with no little diffidence that I promised to comply with the request of your able and energetic secretary, Mr. Colyer, to read before you an account of my experiences with an anæsthetic into the physiological action of which I have had neither the leisure nor the ability to enquire. Since, however, Dr. Dudley Buxton has kindly consented to supplement my remarks by an account of the drug in its chemical, physical, and physiogical aspects, I feel that what I have to say will not be altogether valueless, even if it be no more than the preface to a description that is certain to be highly interesting and scientifically accurate.

Pental is a new drug only as regards its name and the method of its preparation—it is, in fact, the amylene of Snow. The manufacturer claims for it a definite and unvarying chemical composition and a constant boiling point, while it is known that amylene was an uncertain compound with a very variable boiling point. Moreover it is stated that pental by the present process of manufacture, is quite freed from the impurities that were present in amylene, and which were supposed to have occasioned death in those cases in which the administration of the latter drug proved fatal. Those of you who are familiar with Snow's account of the effects of amylene will notice that however much pental may differ from it chemically, there is a striking resemblance in the results obtained by their administration.

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* Read before the Odontological Society of Great Britain.

Pental or isoamylene C_5H_{10}, or to be more correct, $(\mathrm{C.H.}_3)_2\ \mathrm{C.CH.C.H.}^3$, is a colourless liquid of low specific gravity having a constant boiling point of 38° C. It is obtained from amylene hydrate by heating with acids. It is insoluble in water, but mixes with chloroform, ether, and alcohol. It is extremely volatile and inflammable. It has a peculiar and somewhat disagreeable odour, but is so little irritating that the pure vapour can be inhaled without the slightest discomfort. It is manufactured by C. A. F. Kahlbaum, of Berlin, who sends it out in cases holding ten small bottles, each containing about five drachms.

The following account is taken verbatim from a short paper contributed to the *Journal of the British Dental Association.* It may be considered to embody my personal experiences up to date, because, for reasons that will presently be obvious, I have used pental but very occasionally since the announcement in the *British Journal of Dental Science*, of December last, of three deaths due to its administration.

"In my early experiments with pental I endeavoured to induce anæsthesia by administering the drug by the open method. This I found most unsatisfactory. After administering it about half a dozen times I arrived at the conclusion that to produce the degree of anæsthesia requisite for the painless extraction of teeth some other than the open method must be adopted. This, my later experience, has been somewhat modified, for I may anticipate by stating that the most striking feature in connection with pental is, that anæsthesia sufficiently profound for the painless extraction of several teeth may be induced by it without the development of any of the indications that usually accompany such a degree of unconsciousness. Subsequent experiment has convinced me that in the early cases referred to sufficient anæsthesia was produced for the purposes of the dental surgeon, although I was not then sufficiently acquainted with the peculiarities of pental narcosis to be aware of the fact. The open method, however, should never be employed—firstly, because it is very wasteful, both of the drug and the administrator's time; secondly, because there is usually considerable excitement before anæsthesia supervenes when it is induced by that method; and thirdly, because individual susceptibility to the drug varies so much that (in the absence of the usual indications of anæsthesia) it is almost impossible to know when the patient is sufficiently 'under' to render an operation painless. Of course, if the pental were pushed until the conjunctival reflex were abolished and muscular relaxation established, the last mentioned objection would be overcome. To do this, however, in some cases more than an ounce of the drug would have to be used, and the patient subjected to unnecessary risk.

"The first case in which I gave it for operation was that of a girl about 18 years of age. The apparatus used was one of the old-fashioned cone-shaped gas face pieces with inspiratory valve at the summit of the cone and expiratory valve about half way between its base and apex. I removed both valves and fixed a spiral wire, upon which lint was stretched inside the face piece, so that by dropping pental through the opening left by the expiratory valve it would fall upon the lint. In this case the following phenomena were noticed: After the first two or three inspirations the pulse became rather accelerated, but its force was undiminished. The face became flushed, and just before the termination of the administration the pupils became slightly dilated, the eyes fixed and staring, the lids being widely open. Respiration was unaltered. In three minutes from the commencement of administration the conjunctival reflex was lost, four and a half drachms of pental having been used.

"I then operated, although there was no muscular relaxation, extracting three roots of a left upper first molar, a second bicuspid and two roots of a right lower molar. The patient remained unconscious for about a minute after the teeth were extracted, coming to with a start and a vacant gaze round the room. For about half a minute the voice was slightly thick, after which time there was no indication of the patient's having been anæsthetised, except that the breath was strongly suggestive of pental. Throughout the whole administration, after the first two or three inhalations until within a second or two of the operation, the patient was very restless and excited, behaving much like one recovering from ether administration. There were no after effects, and when the girl was seen a few days later she expressed herself quite willing to 'take it again' if necessary. This case is fairly typical of all (about thirty in number) in which this form of apparatus was used, excepting that in the majority I operated before loss of the conjunctival reflex became manifest.

"It then occurred to me to attach a bag to the apex of the face-piece, converting it into something similar to an Ormesby inhaler, the chief difference being that the pental was allowed to drop upon the lint during inhalation through the opening of the expiratory valve, instead of being previously poured upon a sponge, as in the case of ether administration. I then found that anæsthesia, sufficient for the extraction of several teeth, could be induced by this method in about ninety seconds, a little more than two drachms of pental being used, excitement during its administration being very unusual.

"The next form of inhaler and the one I now use is that I had previously used for giving a whiff of ether with the gas when it was desirable to prolong the anæsthesia. Its construction is very simple. The oval chamber contains the ether (or pental), which is poured into it through the bent funnel. The central tube runs right through the ether chamber, and the face piece is attached to one end of it, the bag to the other. Half way along it is a half diaphragm, on either side of which are key-hole slots, that form the means of communication between the chamber and the inside of the tube. Inside the tube is another tube, which fits it closely. This may be made to revolve within the first tube by turning a handle, which is screwed into the inner tube, and passes through a slot in the outer tube. When the handle is turned in one direction the key-hole slots in the central tube are covered, and the patient would breathe into and from the bag, no air passing into the chamber. When the handle is turned in the opposite direction the inner tube revolves and uncovers the openings in the outer tube, and at the same time converts the half diaphragm into a complete one, so that the expired air from the patient passes through the chamber into the bag, inspired air retracing the same course. In intermediate positions of the handle, proportional quantities of air pass through the chamber, the rest passing direct through the tube into the bag. With this apparatus the majority of the cases (about 180) in which I have used pental have been anæsthetised. The method used has been as follows:—About **two** drachms of pental are poured into the inhaler, the bag being detached and the handle turned to *O*. It is then applied to the face and the patient directed to breathe deeply, the bag being popped on at the end of an inspiration and the handle turned to a quarter on, the patient at the same time being told to breathe *gently.* If the breathing be *quiet* the handle is at once turned to 2, viz., half way on, and from ten to fifteen seconds later turned fully on for one or two inspirations, and then turned again to O, the patient being allowed to expire into and respire from the bag until nearly forty seconds from the commencement of inhalation, when as a rule, the operation may be proceeded with : the usual duration of administration being from thirty to forty seconds. The amount of pental used is from a half to nearly one drachm.

"Having thus far described the method of administration I will now make some general remarks upon the results obtained with this apparatus, used in the manner described.

"In the majority of cases the following phenomena were noticed :—Almost immediately the pental was inhaled there was slight flushing of the face and quickening of the pulse, the increased frequency being unaccompanied by any diminution of force. Respiration, if quiet at the commencement of the inhalation, became deep and rapid when the handle of the inhaler was turned to full, but became quieter when it was turned off. The eyes, if closed, opened as the patient became anæsthetised, and had a fixed and staring look. The conjunctival reflex was rarely lost, although in some cases I noticed its absence after four or five inspirations, particularly if they were deep. In a few instances there was profuse perspiration after about thirty seconds' inhalation. The duration of the anæsthesia produced was on the average of about one and a half minute, but varied greatly with the patient and with the character of the respiration, never having been less than a minute or more than three ; there was no muscular relaxation. Occasionally the patient's eyes would follow the movements of the operator ; otherwise the patient remained quite still. In about five cases the patients declared they were perfectly conscious throughout but felt no pain, and had no desire to move. There were no after-effects, immediate or remote in any one case. I am speaking now only of those cases in which the pental was administered exactly in the way described above, that is, in all, between 130 and 140 cases. I will now describe a few cases in which the method of administration was varied.

"In two or three instances I have given it to patients who did not wish to be rendered unconscious, and on that account objected to gas. One lady about 40 years of age, required the extraction of a left lower molar. I assured her that if she would do exactly as she was told I would promise to extract the tooth for her painlessly, but at the same time she would be sufficiently conscious to follow my instructions. I used the apparatus described, containing rather more than two drachms of pental, but turned the handle on to full at the very commencement of inhalation. After the patient had taken four deep inspirations I laid aside the apparatus (the patient following my movements with her eyes), told her sharply to open her mouth widely (it was not previously propped), reached for my forceps which were lying on the bracket, and extracted without any movement or expression of pain on the part of the patient, although it was a difficult tooth to remove. A few seconds later, the patient on being directed to rinse the mouth, seemed a little dazed, and had no recollection of the operation, but remembered my having told her to open her mouth.

"I have had three or four similar cases, but in those the patients remembered the extraction of the teeth, although there was no recollection of pain, and in no case was there struggling or noise. In a similar way I have extracted nerves from the front teeth, but in every case in which this was done the patient either felt pain or was completely unconscious. In only one case have dangerous symptoms been met with, but this is interesting as it indicates the great power of the drug.

"Being asked one day to administer it to a lady for the extraction of an upper tooth, I found that I had only about three-quarters of a drachm left. Being anxious to insure anæsthesia I turned the handle of the inhaler on full, and allowed it to remain so throughout the whole of the administration. The breathing was very deep, as it always seemed to become when the concentrated vapour was inhaled. After the first few inspirations I knew by experience that the whole of the pental had evaporated. The administrator becomes aware of this fact by the sensation conveyed to the hand by which the inhaler is held, the inhaler becoming perceptibly colder at each inspiration, while it contains any liquid pental, ceasing to do so when it is empty. I was afraid therefore, that the re-breathing of such a small quantity would be scarcely sufficient to induce anæsthesia. However, in less than thirty seconds the fixed gaze of the patient, together with a greater dilatation of the pupils than I had ever previously noticed, indicated the supervention of anæsthesia, although the corneal reflex still persisted. The facepiece was therefore removed, and the tooth extracted, the patient's respiration becoming markedly slower as soon as the tooth was removed, finally ceasing altogether about a minute after the removal of the face-piece. Coincident with the entire cessation of respiration, the radial pulse, which throughout the administration was unaltered, became almost imperceptible. The patient was immediately inverted which had the effect of restoring the pulse, but she made no attempt at respiration, and cyanosis was then first observed. She was therefore placed upon the floor, and artificial respiration was commenced in spite of which the cyanosis deepened. The artificial respiration was, however, vigorously kept up for fully seven minutes before the patient initiated any respiratory effort, but when she did recovery was very rapid. It was subsequently elicitated that the patient was just convalescing from a severe attack of bronchitis at the time."

The above account was written in May last, since when I have only administered pental at the express desire of my patients, many of whom prefer it to any other anæsthetic they have taken. The only modification I have since made in the method of administration is by allowing the patient at first to breathe a more diluted vapour, that is to say, by turning the handle of the inhaler less rapidly to full. When this is done the administration lasts a little longer, and more pental is used.

One of the fatal cases referred to is so very similar to the case described above, except as to its unfortunate termination, that I feel I cannot refrain from quoting it. "A healthy, powerful navvy, aged 27, was admitted to the new General Hospital in Hamburg, with a crushed left forefinger which was amputated under pental. The pental was covered with waterproof material poured on the inner side of a small Esmarch mask containing sponge. Anæsthesia followed entirely without 'excitation' so that the operation could be finished after two minutes. When the mask was taken from the patient's face the eyes were opened, pupils tolerably wide. Suddenly the breathing became worse, the patient became cyanotic, and respired only once deeply: then the breathing ceased entirely, and with the cessation of breathing the pulse was imperceptible. In spite of artifical respiration, compression of the heart, tracheotomy and blowing in of air, death followed."

It will thus be seen that whatever may be the safety of pental as compared with chloroform, there can be no doubt that it is more dangerous than N_2O, and that the last-named agent should invariably be chosen for brief operations.

Nevertheless, I am of opinion that those of the medical profession who are in the habit of administering chloroform for operations where N_2O or N_2O and ether could be used equally well, should give the preference to pental, because, even if it be no safer than chloroform (and personally I believe it to be far more so), the ease of its administration, the certainty of its action, the rapidity of recovery after its use, and the entire absence of after-effects, entitle it to a claim upon the consideration of those who deem chloroform a justifiable anæsthetic in dental surgery. This view, I see by the *British Medical Journal* of February 17, is taken by Phillip, who states that during twelve months, chloroform and pental were the only anæsthetics used in Kaiser Friedrich's Children's Hospital at Berlin, and that "judging by 1,000 narcoses, pental is with certain exceptions always able to replace chloroform, being less dangerous and without after-effects."

PYORRHŒA ALVEOLARIS.*

By Mr. Booth.

Mr. President and Gentlemen.—The subject to which I wish briefly to call your attention this evening is perhaps best known to some of us under a different heading, viz., Rigg's disease, or Absorption of the Alveolus, the latter perhaps being the most applicable.

The above disease is defined by Miller, as a chronic suppurrative inflammation of the periosteum and necrosis of the alveolar wall of the diseased teeth, and is most frequently met with in elderly people of the poorer class, although it is not unfrequent to find it presenting itself in children. The teeth usually affected are the inferior incisors.

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*Read before the Students' Society, Victoria Dental Hospital, Manchester.

General Appearances and Symptoms.

The first stages of the disease present little that is characteristic. It manifests itself only as a slight redness of the gums at the neck of the tooth, presenting a slightly puffy appearance, associated with congestion and pain of a neuralgic type. The tooth perhaps is a little loose, but not sufficient to cause much inconvenience, and it is no doubt owing to this, that most of the cases do not come under our notice until they are in an advanced stage. In later stages, distinct characteristic symptoms make their appearance, the connection between the root and the alveolus is destroyed by suppuration of the pericementum, the gums become more congested and of a dark red or bluish red colour, and but loosely surround the neck of the tooth. Pressure upon the gums causes a slight discharge of pus at this stage of the disease. As it progresses the alveolus becomes gradually affected and broken down, this being the belief of those who do not think that the bone is the seat of primary infection. The gums about this time become hypertrophied, or gradually recede exposing more or less a portion of the roots. The destruction may take place symmetrically around the root, or one side only may be affected, the one most frequently attacked being the labial. The upper part of the alveolus is destroyed much more rapidly than the lower. In addition to this destruction of the alveolus one of our recent writers states that there is generally present a thin ring of dark coloured tartar surrounding the neck of the tooth, this being regarded as a result, and not a cause of the disease. The disease seems to have a tendency to spread, this being no doubt due to an infectious organism, and will receive our attention under the etiology of the disease.

Causes.

The etiology of the disease is a much debated question, and at the present time there is great difference of opinion as to its origin, some believing it to be constitutional; others have the idea that it is due to local irritation, for whose causation, a general predisposing bodily disorder is essential ; and lastly, some think that infectious bacteria play a most important part.

For convenience the causes may be divided into—

(1) Constitutional or Predisposing.

(2) Local Irritation.

(3) Bacteria.

The constitutional disorders which are generally associated with the disease, are *gout*, *rheumatism*, *rachitis*, *scrofula*. *struma*, and diseases where there is peripheral congestion. Severe *fevers*, and hygenic conditions are also predisposing causes.

In a case of gouty diathesis, there is an increased deposit of salts in the blood, and from the blood it passes into the tissues. These salts have been shown, by chemical analysis, to consist of calcium and sodium urates, and also a small percentage of calcium phosphate. It is stated by pathologists that there is scarcely a tissue or organ which has not been found to be the seat of deposit, leading to an alteration in its structure and functional activity. In many cases of pyorrhœa alveolaris you have generally speaking, some indications of gout either in joints, viscera, nervous tissue or tegument, and a careful examination will no doubt reveal manifestations of the same.

Rachitis seems to furnish especial predisposition for pyorrhœa alveolaris.

It is well known that the milk teeth of rachitic children are shed at an early age. When therefore the disease is designated " peculiar to mature age" an untenable supposition is made, says Miller. He says, having examined twenty-six cases of rachitis in children under twelve years of age, seven manifested pronounced symptoms of pyorrhœa alveolaris, and at the same time stated that there was no symptom present that would have justified him in designating them otherwise.

Scrofula is regarded by some to be a predisposing cause, but too much stress must not be laid upon this theory, as the cases that have come under notice were complicated with rachitis.

In Pregnancy there are sometimes striking affections of the gums, which lead to swelling, puffiness and suppuration of the same at the necks of the tooth. These affections bear considerable resemblance to pyorrhœa alveolaris, and are asserted by some to result in this disease, after repeated pregnancies.

Anhygienic conditions we designate poor quarters, bad food, bad air, want of exercise, &c. One of our writers accuses the use of spirituous liquors as a predisposing cause, resulting in an extra secretion of uric acid.

Local Irritation. As regards local irritation it can either result from tartar, particles of food, or any other mechanical or chemical agent.

There is no doubt that the gums are exposed to manifold accumulation of tartar, and particles of food becoming wedged between the teeth, &c. It is still open whether a local irritation be at all requisite to the origin of the disease, but there is no doubt that the symptoms are greatly aggravated by it.

Bacteria. The disease is no doubt, says one writer, of a parasitical nature.

To Miller we are indebted for the investigation made as to the etiology of the disease so far as organisms are concerned, He experimented by making dilutions like cultures on beef, water, gelatine, of twenty-seven teeth affected with pyorrhœa alveolaris. In two cases only no growth took place, in another it was very stunted, and of the remaining twenty-four cases twelve grew rapidly, five but moderately, and seven slowly. The gelatine was liquified in five cases only. The organism found in one case was *staphylococcus pyogenes aureus*, and in another *staphylococcus pyogenes albus*.

Two formed yellow and one green colouring matter, the latter being rather interesting on account of it not forming pigment when air is not accessible, but on access it almost immediately forms a beautiful green colour.

In twenty-two cases out of twenty-seven under investigation, twenty-two different kinds of bacteria were found. Therefore from the above we may conclude that there is a specific bacteria present in the disease.

TREATMENT.

In early stages a great deal may be done to prevent the disease progressing, although we might not be able to effect a permanent cure. A thorough examination of the mouth will show at what stage the disease has arrived, and also whether there are any complications present, such as tartar, particles of food wedged between teeth, &c.

The treatment may be divided into :—

(*a*) Local.

(*b*) Constitutional.

First of all one would remove any deposits that may be present, and on removal the sulci should be well syringed with an antiseptic lotion.

As regards the instruments for the removal of tartar, I think you will hardly find two practitioners that would use the same, although there may be a great similarity, but perhaps those most familiar to us are Hows' and Lord's sets of scalers.

In the Summer Lectures on Operative Dentistry last year, there was shown to us by Mr. Whittaker, a useful instrument for removing tartar, which if I remember right was a slight modification of a spoon excavator.

In a case where separation extends down, the treatment seems to be more complicated, anyhow as far as the late Dr. Riggs' treatment went. In such a case he believed the bone to be in a state of disintegration, and so as to obtain a fresh surface, the bone should be thoroughly scraped, with scalers similar to those of Dr. Lord's. Tomes does not doubt that this treatment acts very satisfactorily as far as temporary improvement goes, much more so than ordinary scaling, but in most cases when they seem to be progressing favourably, after six months or so the disease returns, and perhaps is even worse than when primarily affected.

Some practitioners seem to think that the scarified bone is renewed, but whether it is so or not, seems to be an open question.

After thorough use of scalers, the teeth should be further cleaned by means of a revolving brush and pumice. Whether or not iodine mixed with the pumice would yield better results, I am not able to judge, but I should rather think it would prove satisfactory, being both an antiseptic and disinfectant, and although an irritant, it might so act by causing new granulation tissue to form beneath the diseased gum.

After the mechanical treatment, Miller reccommends the use of nitric acid (2 to 4 per cent. sol.). Generally after the mechanical treatment, various antiseptic lotions are applied, such as the following :—

Pure carbolic placed in the sulci, and repeated daily, if possible, for perhaps a week or so. If it can be accomplished the gums should be well syringed out after every meal so as to clear away any food that may have become lodged in the sulci.

A solution of Hydrarg. Perchl. in Peroxide of Hyd. 1 gr. to ℥ij. is supposed by some to be a very useful lotion.

Others recommend Iodide of zinc in severe cases, and for less severe, Iodoform and aromatic Sulphuric acid. Tomes suggests a rather eccentric treatment, that of vigorously rubbing the gums with the finger, this proving very advantageous, the patient being cautioned not to rub the actual edge.

In some cases after the last named treatment the gums become congested and bleed very readily, in such a case an astringent mouthwash must be used; a most useful, and also a more or less pleasant one from a patient's point of view-being Tannin in combination with Eau de Cologne ʒi to ℥i, Any teeth that happen to be loose, and there seeming no hope of their ever becoming firm, should be extracted, and those which are in a more favourable state should, says one writer, be kept in position by a vulcanite plate being brought well up the neck of the affected tooth. Other writers are in favour of ligatures, causing less inconvenience to the patient, care being taken that the ligature does not pass beyond the neck towards the root.

In addition to the usual local and constitutional treatment of the disease, Roush has found electricity to be of great value in exciting a healthy condition in the tissues involved in this annoying affection.

The mode of treatment is as follows: —

After taking away the deposits of tartar and injecting the sulci with an antiseptic solution, the patient is told to pay another visit two or three days later, as by that time all inflammation would have subsided, the gums bleeding less readily, and the general condition improved.

After the above procedure, the electric battery is employed with one of the poles provided with a needle, and to the other pole is attached a small sponge, the needle is then inserted at the neck of the tooth, and the sponge placed on the opposite side, so that the current may affect the whole socket. After a few moments the needle is withdrawn and again inserted in another portion, moving the sponge accordingly, this being repeated six or eight times until the needle has been inserted around the whole of the affected teeth.

He has even found that this treatment proves beneficial if there has been suppuration and inflammation present, and he has also the idea that in addition to stimulating the soft parts to healthy action, it causes a deposit of bony material around the tooth.

He verified his belief by treatment of two teeth affected with Pyorrhœa Alveolaris; in one electricity was the treatment, in the other application of useful drugs, in two weeks the one treated by the electrical method was quite firm, whereas in the case of the drug treatment, the tooth was quite moveable.

Constitutional Treatment.

The constitutional treatment must be directed against the predisposing cause and varies a great deal, according to the history of the patient, but any constitutional taint should be referred to a medical practitioner.

The Prognosis.

The prognosis is generally unfavourable. In front teeth however, a marked improvement if not a radical cure may be affected. Although the case may be far advanced suppuration has been known to subside, but recurs again at a later period.

In conclusion, gentlemen, it only remains for me to thank you for the attention with which you have listened to a somewhat uninteresting paper, but I hope although you may not have derived much benefit from the paper itself, that each one of us may gain great benefit from the discussion which is to follow.

FRACTURES OF INFERIOR MAXILLA.*

By Mr. F. M. F. Bellaby.

Mr. President and Gentlemen,—In treating this subject we will take first of all the causes of fracture, which are various and comprise kicks from horses, blows from the fist, falls from heights or even from slipping whilst walking and not necessarily directly on to the chin, although that is the most common. Gunshot injuries are also a source of fracture, often splintering and removing large portions of the bone, accompanied by laceration of the the cheek and lips. A number of fractures are also caused by the passage of the wheel of a conveyance over the face and jaw also usually causing external wounds of the face. There are some few cases recorded in which the action of the muscles (as in the act of yawning) has caused a fracture, and Professor Pancoast describes a case, in which fracture of the neck of the bone was caused by a violent fit of coughing, in an old man upwards of 70 years of age. Lastly comes the cause which more directly concerns the dentist, and that is fracture during the extraction of a tooth, which may or may not be due to unskilful treatment, although this is far less common nowadays since the old fashioned and clumsy key has greatly fallen into disuse, and properly fashioned and even delicate forceps have taken its place. Fractures of the alveolus are often unavoidable, during the extraction of the molar teeth, even in the most experienced hands, but these ordinarily give little inconvenience as they only hasten the absorption which the alveolus must necessarily undergo after the removal of a tooth.

Fractures of the lower jaw are nearly always compound towards the mouth, due to the thinness and inelasticity of the mucous membrane, the skin however, is rarely involved When the ramus, or coronoid process, or condyle, is broken, the fracture is not usually compound owing to the deeper situation of the bone.

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* Read before the Students' Society, Victoria Dental Hospital, Manchester.

In the body of the jaw the fracture occurs most frequently in the canine region, due most probably to the greater depth of its socket and the consequent weakness of the bone at that place.

The direction of the fracture is usually oblique and is generally at the expense of the outer plate of the anterior fragment and the inner plate of the posterior fragment but it may be quite vertical at the symphysis.

Fracture of the ascending ramus may occur in nearly any situation and is generally the result of great violence ; the angle and condyloid process being frequent seats of the injury.

Symptoms. The position of a patient with fracture of the lower jaw is very characteristic as he usually tries to support and steady the fragments with his hands in a very careful manner and his appearance and anxiety for relief is often made laughable by his being unable to tell coherently what his ailment is.

In horizontal fracture, as well as of the ascending ramus, there is pain on opening the mouth and, in the horizontal position, also distinct crepitus to be felt. There is also sometimes alteration in the line of the teeth due to displacement of the parts. There is more or less dribbling of saliva, and, if the displacement is great, there is inability to close the mouth.

Displacement varies according to the character and situation of the fracture. If it is single and through the canine region, the smaller fragment generally overlaps the greater owing to the temporal and masseter muscles] drawing the smaller piece into an outward and slightly forward direction.

In double fractures through the canine regions the small or middle fragment is drawn downwards and backwards by the depressor muscles of the jaw, and the lateral portions are drawn forwards and outwards by the temporal and masseter muscles. In fracture through the molar region the smaller fragment is drawn upwards and inwards by the action of the pterygoid and temporal muscles.

Fractures of the ascending ramus is usually produced by some crushing force, such as the wheel of a carriage, the bruising of the soft parts being often considerable, but there is usually little displacement owing to the deep situation of the bone and to its being well supported on each side by the masseter and internal pterygoid muscles. The pain is referred to the fractured part and there is usually crepitus to be felt. In severe cases the upper fragment may be tilted forwards by the temporal muscle. In fracture about the angle of the jaw the pain is often referred to the wisdom tooth or the mental foramen and if the part is much swollen the injury may be overlooked.

Fracture of the condyle is generally caused by a fall from a height and is accompanied by pain and difficulty in moving the affected side. The condyle may be drawn inwards and forwards on the eminentia articularis by the external pterygoid muscle. The chin is turned towards the affected side and not from it as is the case in dislocation of one side of the jaw.

Fracture of the coronoid process is a rare occurrence and the small fragment would most probably be drawn upwards and backwards by the temporal muscle and this displacement could be felt inside the mouth.

Complications may be severe wounds of the face, chiefly occurring in connection with gunshot injuries and the result of a kick from a horse ; hæmorrhage from the laceration of soft parts is usually all that occurs, the tearing of the dental artery being a rare occurrence owing to its elasticity allowing it to undergo successfully the slight stretching which it gets in the majority of cases.

In the case of severe laceration of the face, the facial and transverse facial arteries may be injured.

Dyspnœa may be caused by the infiltration of blood into the tissues about the root of the tongue. Dislocation is also sometimes one of the complications of fracture.

Paralysis and neuralgia may also occur from injury to the inferior dental nerve, or implication, or pressure on it by the callus thrown out from the fracture.

Dislocation of the teeth is not unfrequent from the result of a blow causing the fracture, or of the fracture being through the socket of a tooth. Fracture of the teeth is often the result of direct violence, or of them being driven forcibly together. There may be direct injury to the skul by the broken jaw being driven violently against it. Sometimes there is more or less necrosis of the ends of the fragments (chiefly the result of gunshot injuries) leading to abscess or salivary fistula.

Necrosis to the extent of small pieces of alveolus often occurs without causing any deformity. A portion of the body of the bone, in the case of comminuted fracture, may become so detached as to lose its vitality, and the consequent deformity is liable to be very great.

Abscess is also not uncommon, but is in the majority of cases, due to the pressure of the apparatus used during treatment. Salivary fistula may also occur from an abscess bursting externally. Dislocation, as a complication of fracture, is rare, the fact of fracture having occurred tending to prevent it as the necessary leverage would thus be interfered with. Irregular union may also take place owing to the difficulty of keeping the parts in proper position on account of the displacement being so great. Non-union may also occur and is, in some cases, the result of neglect of treatment, but the most common cause is necrosis at the fractured ends. A false joint may be formed, but is very rare, being only about 2 per cent.

Now we will consider the treatment for the various forms of fracture. The methods used for keeping the fractured parts in contact, so that the bony union may take place successfully, are both external and internal, the two methods being combined in some cases.

The most simple and quickest applied method is what is known as the "Four-tailed bandage," which consists of an ordinary piece of roll bandage about three inches wide, and a yard long, with a slit cut in the centre of it, about three or four inches long, to allow the chin to pass through, parallel to and an inch from the edge. Each end of the bandage is then slit down the middle to within about a couple of inches of the opening for the chin.

To apply the bandage the narrow part of the central slit is placed in front of the lower lip and the broadest part beneath the jaw, the chin of course protruding through the opening. The two tails corresponding to the lower part of the bandage are then carried over the top of the head and tied, and the other two ends are crossed over them, and are tied round the nape of the neck. The ends of the two bandages thus formed are then tied together at the back of the head.

This bandage may be supplemented by cutting a piece of gutta-percha so as to resemble the four tailed bandage without the slit for the chin and the ends only long enough to pass up each side of the jaw. This should be softened in hot water and then lined with lint or some other soft material, to prevent the pressure of the splint on the bony eminences of the jaw causing sores.

Hamilton has devised a bandage which has not quite so much tendency to draw the anterior fragment backwards, when there is a double fracture, but its principle is very nearly the same as the four-tailed bandage, but with straps substituted for the bandage, and without a strap passing backwards to the neck.

The internal method which seems to recommend itself as being the best, as also the cleanest and most comfortable to the patient, is the one known as the "Hammond wire splint," and is adjusted in the following manner:—If it is possible to ligature the teeth so as to hold the fragments temporarily in position, this is done, and models of the upper and lower jaws are taken in very soft wax. Counter models in plaster are taken of these in the ordinary way, and then, if there is any displacement, the model of the lower jaw is sawn through between the teeth on each side the fracture, and the pieces adjusted to the bite and fixed in position by sinking into plaster.

Then with a piece of iron wire, the thickness of a stout hair-pin will do, make a frame to fit round the teeth and solder the two ends together with silver solder. Then cut severa five inch lengths of fine soft iron binding wire.

To adjust the splint, the patient should first be directed to use an antiseptic mouth wash, and then the frame is gently slipped over the teeth and the parts adjusted carefully into position. Then with the left hand hold it firmly in place while with the right hand one of the pieces of binding wire is taken and passed over the front bar between the molars on one side, so that the end will come out under the inner bar. Then when the point can be felt it is turned upwards and outwards over the inner bar, and then carried under the outer bar where the ends are crossed and turned aside. This is repeated on the other side, and in as many places as may be thought necessary. When all the wires are in place the ends of the first wire are twisted nearly tight, and so with all the others. Then all the ligatures are twisted quite tight, and the ends cut off about half an inch from the frame, the pieces left being tucked away under the bar. It will be found necessary to tighten the wires after a day or two, owing to the movement of the teeth in their sockets, and this should be done carefully. If the teeth are too loose or so few that the Hammond splint would not be likely to keep the fractured parts in good position, the following method is most useful. An impression in wax of the lower jaw is taken without any attempt at reduction of the fracture, and a plaster model made from it. Then metal dies and counter dies are cast, on which a brass plate is roughly stuck up to cover the teeth and gums. The plate is then divided at the fracture. The two plates, or if the fracture is double, three plates, are then put into their corresponding places in the mouth, and the fractured parts brought into apposition and held so while an assistant places a piece of plastic composition over them at the junction of the fracture. When the composition is hard the whole is removed from the mouth.

The plaster model is then divided at the line of fracture, and each piece placed into position inside the cap, and fixed into place with wax and resin. The pieces thus fixed are set into a bed of plaster and in this position correspond to the normal condition of the mouth.

The brass plates used for getting the accurate position of the jaw are fixed on a model, and metal dies and counter dies are again taken, and a silver plate stuck up large enough to embrace the teeth and gums. The silver plate is then finished to the proper size, and holes perforated on the buccal surface through which the parts may be syringed with some antiseptic fluid, and a strip of platina gauze soldered inside the lingual surface to keep the lining, which is to be of gutta-percha, in place. The brass cap and wax are now removed from the plaster model and a sheet of gutta-percha, softened and dried, placed over the model, which is previously smeared with soap, to prevent the gutta-percha sticking to it. The plate is now heated and pressed over the gutta-percha, but not quite home. The whole is then removed from the model before it is cold, and after washing the soap from the gutta-percha with warm water, it is dipped for from ten to twenty seconds in boiling water, and for one or two seconds into cold water, and then the plate is placed into position in the mouth and pressed well home, the parts being held firmly in place till the gutta-percha is quite set.

While this splint is being worn a disinfectant mouth-wash should be freely used. When removing the splint it is often necessary to keep hot water in the mouth for a few minutes.

Suture of the jaw itself is a method adopted in a great number of our large hospitals for the treatment of old as well as new fractures. The patient is put under the influence of an anæsthetic, and a hole drilled through each fragment about one eighth of an inch from the rough ends, and between the roots of two teeth if possible, and a stout silver wire passed through one hole from without inwards, and through the other in the opposite direction, and the ends twisted tightly together so as to keep the parts firmly in position. After union has taken place the wire is removed.

Some operators prefer putting silver pins through the holes drilled in the jaw and then keeping the fragments in position by suturing the pins together at the back and front.

Mr. Gunning's method is to make a splint of vulcanite enclosing the teeth and gums of the lower jaw and having its upper surface resting against the upper teeth when the jaws are closed. Holes are drilled through the top of the splint for the purpose of syringing the parts during treatment. The splint is lined with gutta percha to keep it firmly in position.

If there is a very bad vertical displacement the splint must also fit the gums and teeth of the upper jaw, an opening being made in the centre to permit of syringing and also for the passage of food into the mouth, &c. This splint may be kept in place by means of fine screws passing between the roots of firm teeth, or the four-tailed bandage may be applied to keep the jaws closed and firm. This splint is very useful for the treatment of fractured condyle.

The treatment of ununited fracture of the jaw, supposing slight necrosis of the fractured surfaces to be the cause, is for the necrosed bone to be removed, or afforded time to come away, and then the same treatment is adopted as if it were a new fracture. If the cause however is merely the result of neglect of treatment, rubbing the two fragments together, so as to get new surfaces opposed to one another, and then applying the usual remedy will generally have a good result.

When the fracture is accompanied by a wound in the face, the wound is treated on ordinary principles and is of very little concern as regards the fracture (which is also most probably compound into the mouth). It may, however, interfere with the application of the necessary retaining apparatus.

Severe hæmorrhage may be controlled by digital pressure on the carotid artery. If the facial or transverse facial arteries are injured and the bleeding cannot be subdued by ordinary means, it may be necessary to ligature them.

If a tooth is missing at the line of fracture and there is difficulty in approximating the fragments the possibility of the tooth being between the parts must not be overlooked and if such is the case it should be at once removed.

In fracture accompanied with dislocation the latter is to be first reduced and then the treatment of the fracture is all that will be necessary.

Cases are sometimes recorded of union taking place without treatment, but the period of union under treatment is usually about six weeks.

British Journal of Dental Science.

LONDON, APRIL 16th, 1894.

THE INTERNATIONAL MEDICAL CONGRESS.

It is satisfactory to find that the Medical Congress recently held at Rome did not, after all, suffer from the postponement which was decided upon last year in consequence of the existence of cholera in Europe. All accounts seem to agree that the amount of scientific work, contributed to the eleventh Congress, fully realized what might be expected on such an occasion. We fear, however, that the physical and personal comfort of those attending left something to be desired. Special delegations had been appointed to look after the interests of the representatives of the various foreign committees, but some of the rank and file must have been at a disadvantage. For instance, according to private letters that reached London, the refreshment room was invaded on the opening day by a large party of provincial Germans, and the English and other members apparently were obliged to content themselves by handing in protests. Of the 7000 members of Congress, Germany headed the list with 900, and England and the British Colonies came next with 700. Professor Baccelli, the President, besides being well known as an eminent physician, holds office for the second time as Minister of Public Instruction, and the opening ceremony was attended by the King and Queen, and the Prime Minister.

Amongst the Addresses delivered before the General Meeting, was one by Prof. Michael Foster upon the organisation of Science. He pointed out that there are two main incitements to investigation—one, the love of fame ; and the other, love of truth. The latter is the most important, and would be much benefitted by some form of organisation, which, however, would not be favourable to mere personal ambition. The Professor suggests the formation of a Guild to unite workers in any one branch, and thus save much of the waste of effort which now results. At present every inquirer knows "he is sure to come upon side issues which have to be investigated, and he is obliged either to devote much time and partly to solve them, or he has to leave them alone." Under a proper organisation the younger workers could materially assist if only their endeavours were usefully directed in the right direction by concerted action. Another interesting address, which well repays perusal, was given by Prof. BIZZOZERO. He dealt with the growth and regeneraion of the organism, and discussed such questions as the mechanism of repair of tissues, and the influence, during this process, of nutrition and of the nervous system. All interested in the Healing Art, and who do not wish to practise empirically, must be concerned in the subject. We gather that the author is sceptical as to the existence of "trophic" nerve fibres. He believes "that each part of the body represents a multiplicity of small active centres or elements, and that there is no anatomical centre from which all the activities of the body are directed." Dr. BABES, of Bucharest, who has done much good work in Bacteriology, chose as his subject the position of the State in respect of this branch of Science. Although other countries possess institutions, privately erected, for the study of infectious diseases, Roumania is the only one which has State laboratories, and although these are not in the speaker's opinion sufficiently endowed, he was able to refer to the excellent results obtained, and to the services rendered to hygiene and science.

Amongst the Sections, that of Odontology naturally attracts our attention. Messrs. J. HOWARD MUMMERY and GEORGE CUNNINGHAM were elected honorary presidents. The latter gave an interesting address on the results of collective investigation as to the condition of School children's teeth.

As the outcome of a lively debate which followed, it was unanimously resolved to appoint an International Committee to extend the investigation on the uniform plan already adopted.

Professor MILLER, of Berlin, made a communication of practical importance as to the possibility of rendering the natural contents of the pulp chamber permanently sterile, and so diminishing greatly the length of time involved by their thorough removal. A pastille was placed over the commencement of the root canal containing hydrarg. bichlor., 0·004 gramme, and acid thymic., 0·006 gramme. An insoluble albuminate of mercury is formed by the action on the remnants of the pulp. This salt is itself a germicide of considerable power.

MILK AND MICROBES.—We are not certain as to the part played by micro-organisms during the various stages of digestion. That large numbers are present in the alimentary canal, is, however, well known. MM. Gilbert and Dominici have found that an exclusive milk diet has the effect of diminishing the microbes to a very remarkable extent. The contents of the intestines were examined and a comparison instituted as to the ratio of organisms per milligramme before and during the milk diet. In this way it was possible to estimate that in five days the number of microbes eliminated daily by the alimentary canal had fallen from nearly 12 milliards to 164 millions, that is, about one-seventh of the normal. A dog was fed for two weeks on milk, and killed two hours after the ingestion of 300 grammes. It was found that the stomach contained only 100 germs per milligramme, instead of 50,000 as is normally the case. Similarly striking results were shown in the other portions of the alimentary tract. These facts are taken to explain the beneficial effects of a strict milk diet in some forms of dyspepsia due to putrefaction, in typhoid fever and other like conditions, or where the liver does not satisfactorily perform its antitoxic function.

Tuberculous Food.—Of recent years there has come an awakening with regard to the communicability of phthisis, and a better understanding as to the origin of tuberculosis in other parts of the body. Our milk supply may account for a good many of the infantile cases, and, as we have before pointed out, there is still great carelessness as to our meat. As if to obviate any necessity for State interference a Dr Rohrbeck has constructed an apparatus by which the consumer may safely sterilise his tuberculous meat. A double-walled cylindrical boiler is used, air-tight and capable of standing an overpressure of one atmosphere. Thermometers, passed into the thickest part of the meat, announce by bell communication when the temperature reaches 100 C. By experiments upon guinea-pigs it is held to be proved that the meat is completely sterilized by this steam-boiling process, and it is reported that several magistrates and other municipal authorities were recently invited to the Berlin central slaughter-house, and partook of sterilized tuberculous beef.

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Scurvy Rickets.—Dr. Railton has read a paper before the Manchester Pathological Society based upon some cases in which Scurvy co-existed with Rickets. He does not suggest that the two conditions conjoined constitute a distinct entity, but regards scurvy rickets as a fortuitous combination of two diseases either of which may exist separately. The explanation offered as to causation seems a simple one. Many artificial foods, upon which infants are so often fed, are deficient in the anti-scorbutic element and, remembering the important part played in rickets by improper feeding, it is a matter of surprise that so few rickety children show signs of scurvy. Dr. Railton's cases were seen in the earlier stages, and the treatment employed was orange juice for the scurvy, and cod-liver oil, or beef tea, for the rickets. The gums were not spongy orulcerated, a condition occurring in fifteen of thirty-one cases recorded in Dr. Barlow's table.

Colour-Hearing.—That a small proportion of persons are "blind" with respect to certain colours is well recognised, but that some people habitually "see" a particular colour when hearing certain sounds is a fact little known. Dr. Colman gives a most interesting account of this condition in *The Lancet*. "Colour hearing" is the term applied when a colour sensation is excited by some auditory stimulus, as, for example, by the pronunciation of the vowel sounds. This phenomenon belongs to a group known as "associated sensations" or secondary sensations," terms applied to sensations depending not on the stimulation of the appropriate sense organ, but of some other. There appears to be a great variety as to the characters of the "photism" in different individuals. As to its position, it is generally referred to the back of the eyes or inside the head, whilst in others there is an apparent background of colour in the field of vision without obscuring objects. The colours are almost always spoken of as being transparent Dr. Colman agrees with other investigators that this faculty has no association whatever with mental disease, or even with a neurotic heredity.

The Use of Lectures.—Opinions differ as to the value to the student, of attending a course of lectures. By some it is regarded as a waste of time which might be more profitably spent with the text-books. Others, and some students amongst them, regard the lectures, or oral teaching, as a most important part. Perhaps, after all, it depends largely upon the lecturer. An address by Dr. Burney Yeo, published in *The Medical Magazine*, deals with the use of lectures in medical teaching, and according to his idea the lecturer should be a store-house of *clear ideas*, for it is his business to strive to make "the crooked straight and the rough places plain." The lecturer's mind, like the student's, should be fixed on examinations, and the need of passing them, so long as we are agreed that they are the best practical tests of knowledge. Dr. Yeo has no sympathy with lecturers "inspiring a love of original research" at all events before the necessary examinations have been passed. Lectures in medical teaching should teach an orderly arrangement of the subject and should promote clear ideas, so that what is arranged in order and stated with clearness can be fixed in the memory and reproduced with comparatively little difficulty. The author thinks that under these circumstances lectures save an enormous amount of time to the student if he makes a right use of them, and that they remove difficulties which constantly arise in unaided reading.

A CRUSADE AGAINST QUACKS.—*Science Siftings*, one of the Journals which, it will be remembered, took some part in drawing attention to the value of electric belts, has just published an account of the trial and conviction of a "professor" at Liverpool. He was accused of obtaining money by false pretences, and was sentenced to five years penal servitude. *Science Siftings* apparently has a department devoted to the investigation of such cases, and those interested in such matters will find some amusing correspondence in its columns. After the verdict of the Liverpool jury, the judge asked the police for some account of the prisoner. It appears that the patients consisted of office-boys, college boys, clergymen, commercial travellers, and good business men in Liverpool. The total income was something like £3000 to £4000 a year. The case presented by the prosecution was that of a poor man who was induced to come from the North of Ireland, and who in the course of a few years managed to pay over £50. Twelve guineas were for an electric appliance "calculated to exercise its benign influence upon the organs of the body and to invigorate and strengthen the organisation." The letters written by the prisoner were headed "Medical Institute," and contained such expressions as "my professional treatment," "safe, speedy and permanent cure," &c,

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary monthly meeting, March 5th, 1894. Mr. Frederick Canton, M.R.C.S., L.R.C.P., L.S.A., L.D.S., President in the chair.

The Minutes of the previous meeting were read and confirmed.

The following were nominated before the Society :—Rhys Price, L.D.S.I., 252, Clapham Road, S.W. (resident); John Dence Whittle, L.D.S. Eng., 17, Summer Row, Birmingham, (non-resident); Walter R. Wood, L.D.S. Eng., 21, Old Steine, Brighton (non-resident); W. Aubrey Farebrother, L.D.S. Eng., 3, New Street, Salisbury (non-resident).

The following were ballotted for and elected members of the Society :—Leslie G. Austen, L.D.S. Eng., 9, Wolsley Road, Crouch End, N. (resident); Leonard Brown, L.D.S. Eng., 7, Spencer Street, Clerkenwell, E.C. (resident) ; John Robert Freeman, L.D.S. Eng., 18, Arabin Road, Brockley, S.E. (resident); Edward Caleb Joseph Hall, L.D.S. Eng., 18, Orchard Street, Portman Square, W. (resident); John Trevor Hankey, L.D.S. Eng., 128, Green Lanes, Stoke Newington, N. (resident); Phillip Harrison, L.D.S. Eng., 36, Finsbury Pavement, E.C. (resident); Albert William Henley L.D.S. Eng., 175, Victoria Street, S.W. (resident); Walter John May, L.D.S. Eng., Dental Hospital of London, Leicester Square, W.C. (resident); William Francis Mellersh, L.D.S. Eng., 2, Eastern Road, East Finchley, N. (resident); Frank Morley, L.D.S. Eng., 42, Albermarle Street, W. (resident) ; Harry Linsell Pillin, L.D.S. Eng., 33, George Street, Hanover Square, W. (resident) ; William Bertram Sansom, L.D.S. Eng., D.M.D. Harv., 84, Harley Street, W. (resident); Joseph Sefton Sewill, L.R.C.P. Lond., M.R.C.S. Eng., 40, Wimpole Street, W. (resident); Harold E. Bullen, L.D.S. Glas., 7, The Parade, Truro (non-resident); Ernest V. Coles, L.D.S. Eng., Montague Road, Uxbridge (non-resident); Arthur Curle, L.D.S. Eng., 30, The Parade, Leamington (non-resident); Albert John Gear Evans, L.D.S. Eng., Windermere, Clythe Park, Newport, Mons. (non-resident); Hedley H. Ham, L.D.S. Eng, Torquay (non-resident); Frederick Haynes, L.D.S. Eng., 11, Hillmarton

Road, Rugby (non-resident); Vacey Limington Hope, L.D.S. Eng., Wellingborough (non-resident); Charles Septimus Hall, L.D.S. Glas., Portland Crescent, Leeds (non-resident); Edward A. Manton, L.D.S. Eng., 14, Grand Rue, Boulogne (non-resident); Charles Henry Oram, L.D.S. Eng., 13, Royal Crescent, Cheltenham (non-resident); William Armston Vice, M.B., C.M. Aber., L.D.S.Edin., D.D.S. Phil., 5, Belvoir Street, Leicester (non-resident); Richard Ernest Woodcock, L.D.S. Eng., Pontefract, Yorkshire (non-resident).

Casual Communications.

Mr. Humby read a note on copper amalgam, as follows:—

In selecting Sullivan's cement, otherwise copper amalgam, as the subject for a casual communication to this Society, there was some risk of wounding the susceptibilities of those who still employ it as a filling. But the selection of filling materials is a matter of such extreme importance in securing sound enduring stoppings, that the risk must be taken. If a tooth be fixed in a vice, and a cavity prepared and filled in the most careful manner, under the most favourable circumstances, and be after examined critically with a strong lens, faults, though not serious ones, will be seen. These minute faults may be present and yet not endanger the safety of a plug under ordinary conditions of the mouth. To prove the truth of this, most fillings which are doing good service, and will probably go on doing so, abound in defects which do not need any lens to demonstrate. Should the substance selected undergo a change of shape because its rate of wear by attrition is greater than that of the tooth substance; should it break up and disappear at cervical margins even quicker than by the wear of eating, should it possess a very objectionable colour and make the tooth tissues a dirty bottle green, then the question must come, is such a combination of faults compatible with the successful conservation of teeth? There are other objectionable features possessed by it, but they mnst be passed over, as they can only be demonstrated by cases in practice. The faults spoken of can be shown here and put beyond the question of a doubt. The reputation enjoyed by the cement is based on the fact that it does not expand or contract, and an erroneous belief that the salts of copper soaking into the tooth prevented any further decay. Its colour being black, its resembles several other filling materials which did preserve the teeth. Coin silver amalgam is in outward appearance very similar to Sullivan's. Palladium amalgam is also black on the surface, but may be distinguished from copper amalgam by being non-lustrous if scraped or filed. Jamieson's eclipse, if unwashed, becomes a jet black in some mouths. Submarine alloy is black. On the good work done by other materials, the repute has been falsely obtained. Though it would be wrong to say that Sullivan's cement is in every case bound to fail, I can affirm this, that during a practice extending over many years, in no single case were symptoms of failure absent in fillings which came under notice the third year after insertion. Many failures were discovered in time to do something still, and the teeth were saved after much trouble. Others, unfortunately, by their failure had tired out the patients, and, rather than submit to further trouble, they preferred extraction. In one striking case a young lady, who, three days previously had her four front teeth filled on their lingual surfaces with copper amalgam, two of the teeth on the left side became changed in colour to a pale green. The fillings were drilled out at once and gold inserted, but the colour deepened until it was so very objectionable that the crown of the left central had to be replaced by a Logan ; the lateral it is contemplated to crown in a like manner. It is not necessary that any comment be made on the alterations in bulk, as the teeth shown will speak for themselves. There is a useful purpose to which the cement may be put, that is, to face the models taken for use in the construction of dentures and crowns to prevent wear during manipulation in the workroom. It may be easily and rapidly made, and the models may be softened and used again and again.

Mr. E. W. ROUGHTON brought forward a case of dentigerous cyst of the lower jaw :—

A.B., aged 10 years, was admitted to the Royal Free Hospital under my care on Dec. 22, 1893. Nine months previously he noticed slight soreness of the lower jaw, followed soon afterwards by the slow development of a swelling in the region of the angle of the jaw. When admitted to the hospital there was a hard, non-elastic swelling the size of half a walnut situated at the left angle of the lower jaw. On putting a finger inside the mouth, the tumour seemed to grow from the interior of the jaw, expanding the outer plate considerably, and the inner plate to a much smaller extent. It was thought that the tumour was probably a myeloid sarcoma and therefore, the only satisfactory way to deal with it was to operate from the outside.

On Dec. 27, the patient having been put under chloro orm, I made an incision one and a half inches long over the tumour, dividing the facial artery between two ligatures. When the tumour was exposed, it was seen that the bony walls were very thin indeed, and that the tumour was cystic On freely opening the cavity, some thin reddish fluid escaped and the crown of a molar tooth was seen snugly reposing within. The tooth and the lining membrane were removed together ; a good sized piece of the cyst wall was then cut away with bone forceps, and an attempt was made to diminish the size of the cavity by breaking in the walls of the cyst, but in doing this the jaw broke across at the angle. The cavity was then stuffed with gauze. Healing took place quickly, and the jaw united well, the patient being sent home on January 17. The encysted tooth—probably the twelve year old molar —presents a well developed crown, but is entirely destitute of roots.

Mr. Bland Sutton said the case brought forward by Mr. Roughton was very interesting, as illustrating in a remarkable way some of the very great difficulties occurring to surgeons in diagnosing between a sarcoma and a dentigerous cyst. He thought it a great pity that so progressive a surgeon as Mr. Roughton should still use a very objectionable term, viz., "dentigerous cyst." Of course, he was well aware that he was addressing the Odontological Society, and from the title of the paper he should not assume that it was anything else than a tumour connected with the jaw. If it had come from any other Society one would have been at a loss to know whether it was an ovarian tumour containing teeth, a pharyngeal or rectal dermoid,or a dermoid from the petrosal. The term "dentigerous cyst" had been applied to all these different tumours, and heventured to point out,as Mr. Tomes did years ago, that the term was now used in a very loose manner, and had lost its original meaning. He thought the Society should set an example by discouraging the use of such a very objectionable term.

Mr. Storer Bennett said the case he wished to bring forward that evening at the risk of giving still greater offence to Mr. Bland Sutton, was one he had ventured to call a dentigerous cyst. The term was one which had become classic from long use, and for their purpose it described pretty well what they understood as cysts developing in the jaws, containing a tooth or a germ of a tooth. The case was that of a man 25 years of age, who came to the Dental Hospital about three weeks ago with a swelling over the right upper central incisor.

On first seeing it he thought the tooth was dead, and directed that it should be drilled to clear out the pulp; but when the house surgeon found the pulp was alive, the swelling was diagnosed as a cyst, arising not from a dead tooth, but from some other cause. The cyst was opened and was found to contain an unerupted tooth. It had at one time been inflamed and pus was evacuated when the cyst was opened. The man had no lateral in the alveolar arch: he had a canine and central incisor, and there was a smallish gap between the central and the canine. He stated that some few months back he had a small tooth with a short root extracted from that particular place with the idea that he would get rid of the swelling and pain, but no relief was produced. He then came to the hospital. An opening was made above the central, and the cavity containing a partly-formed tooth was seen. A considerable amount of fluid escaped. The tooth which he took to be the missing lateral, was inverted, the crown pointing upwards and towards the left. It was somewhat loose, not very firmly attached to the bone, and the amount of root developed was very slight.

Mr. Constant was then called upon for his paper on Pental, which we publish on page 337.

Discussion.

The President said they were indebted to Mr. Constant for bringing the subject of his paper under their notice. Anything likely to give a little more lasting anæsthesia than gas would be of very great advantage. He was sorry that Dr. Dudley Buxton, through illness, was not able to be present, but hoped that some gentlemen would be able to speak of their experience with this drug.

Dr. Prince Stallard said owing to the kindness of Mr. Constant he had come from Manchester to state what little experience he had had in the administration of pental. Before September last he knew little or nothing about it, but at that time their house surgeon one day produced a small bottle of pental and asked him to administer it. He did so, and not knowing in what way to try it, he first of all used the open method which, like Mr. Constant, he certainly would not advise anybody else to adopt. He tried it in fifty persons, all females, ranging in age between 13 and 43. The first was a girl of 22. It was administered on a napkin, similarly to chloroform; it took three minutes to complete anæsthesia, and one and three-quarter ounces were used. She remained under one and a-half minutes. The eye reflexes were present during the whole time, with marked dilatation of the pupils. There was extreme distention of the capillaries of the face, similar to what was seen in the administration of nitrite of amyl. The breathing was normal, and the muscles perfectly placid. There was no headache, and she made a perfectly good recovery. That one case exactly demonstrated what occurs in the open method, and after trying it in six cases he abandoned it for the "Clover" inhaler. After four or five cases he found extreme contraction of the masseter muscles; so much so that there was very great difficulty in opening the jaw. He then tried the use of a prop previous to administration, a practice which in the administration of pental, he must firmly condemn, seeing that in almost every case there was marked muscular rigidity, crowing respiration and laryngeal spasm. This he attributed entirely to the penetrating action of the drug on the upper opening of the trachea. After this unhappy experience of giving it with the prop in the mouth, he left out the prop and gave it without, and found that opening the mouth with a Mason's gag was far superior to the other method. He used the ordinary Clover inhaler. It was very seldom necessary to go beyond three quarters, turning the indicator on to I., and the anæsthesia was very marked and very nice in every way. He had two accidents which, it was only just to state, caused him an immense amount of anxiety. One was in a girl, B. S., æt. 17, a dressmaker. It was given with Clover's inhaler, with gag in the mouth previous to administration. The pre-anæsthetic period took fifty seconds, and there was much stiffening of the muscles. After an extraction, whilst still under the anæsthetic, respiration suddenly ceased. He had not time to feel the pulse, but put her on the floor and did artificial respiration. He did not invert her, nor inject ether, nor use any means to stimulate the heart. Artificial respiration was used for two minutes, when the long-wished-for sigh occurred, and she made a very good recovery. She was particularly asked whether she noticed anything about being moved out of the chair, or when she came round being on the floor, and she said, "No;" she was perfectly satisfied, and thought it was very nice. The second case was that of a girl, æt. 22. Pental was given by the "Clover" inhaler without the prop. The pre-anæsthetic stage was thirty-nine seconds. She was the most markedly anæmic female he had ever seen. Sixteen stumps were extracted, and there was absolutely no bleeding; no blood whatever was noticed from the sockets. Respiration stopped after she had been under seventy-two seconds. Artificial respiration was carried on for five minutes. During this time it was noticed, and the same occurred in the first case, that the corset was extremely tight. It was ripped up with a knife, and she immediately began to breathe ; breathing had absolutely ceased for a period of nearly five minutes. In private practice this would have been an extremely anxious case. These were all cases that had been done in a hospital.

Considering these two cases, he thought they should be extremely careful in giving the drug to anæmic females. It was known that in the administration of gas in anæmia, after the face-piece was removed, the anæsthesia frequently became deeper. The same thing occurred with pental. Notwithstanding these two cases he liked the drug extremely. It was easily taken ; patients did not complain of the smell, or of after-effects, beyond a slight headache. In three cases there had been headache, which had cleared away in the course of half-an-hour. In one case vomiting occurred, but on inquiry it was found that the patient had partaken of a very heavy meal just beforehand. Naturally they were somewhat sceptical of a new anæsthetic ; they liked their old methods and looked askance on anything that was new ; but those who had administered this drug must agree that it was very serviceable for the extraction of several teeth. He had known of a case where fourteen teeth were taken out at one administration. It was also a great gain to have a drug not nearly so dangerous as chloroform, for while the two cases he had mentioned were very trying, a great deal was due to his inexperience in giving the drug. If chloroform had been given, and the patients had gone off into the same condition as during pental administration, no amount of artificial respiration would have brought them round. He looked upon chloroform for the extraction of teeth as an impossible drug, because chloroform should never be given unless the patient was lying absolutely flat, whereas in operations on the teeth it was a very great advantage that the subject should be able to sit up.

The mean age of his cases was about 23, the patients ranging from 13 to 45. Under pental the pre-anæsthetic stage averaged 58 seconds, and the period of anæsthesia 89 seconds. Under gas it might be taken at 51, and the period of anæsthesia from 35 to 45. There was, therefore, a clear gain in the time given to the operator to do what he wished to do. With regard to rigidity, he found very little in the closed method, no air being given, and the patient being told to breathe deeply, just as in giving ether. In one case, that of a Polish Jewess, a very excitable woman —and those who had to do with the Poles knew that they were a very excitable race—she took it extremely well. In the case of one girl, aged 13, she was 32 seconds going under, and 63 seconds under the anæsthetic. She was a marked epileptic, a delicate, underfed, diminutive girl, with marked epileptic fits. She took it extremely well, but in her case there was marked opisthotonos.

Mr. Constant, by his bold experiments in the use of this drug in private practice, had done great service to anæsthetists. Being asked to give a demonstration before the Manchester Odontological Society on November 7, he (Dr. Stallard) did so, and seven or eight teeth were extracted by members, all of whom were very much pleased with the drug—seeing that it gave them a much longer time ; but the general conclusion come to was to let him go on a little bit further before trying it themselves.

Mr. CARTER BRAINE said he had no experience in the administration of pental. One point that struck him was that there were so few signs of anæsthesia, and that, in his opinion, rendered the drug more or less a dangerous one. He was surprised to hear that the closed method had been adopted with the bag. It seemed that the air being so limited by that method, might account for the cases in which artificial respiration was necessary. The odour of the drug was certainly very unpleasant ; he should not like to inhale it on that account alone, and he could not understand how it was that patients did not complain of after-effects. He agreed with the last speaker that chloroform should not be given in dental practice with the patient in an upright position in a dental chair.

Mr. CONSTANT, in reply, expressed regret at the absence of Dr. Dudley Buxton. He should hardly have ventured to have presented the subject as he had done if he could have foreseen Dr. Buxton's absence, because he had only dealt with one side of it, and they would have liked to have heard something of its physiological action. With regard to the prop, they, as dentists, knew the great advantage of the use of that appliance, and he did not find the difficulty Dr. Stallard had spoken of. He had never had a patient complain of the odour, and many to whom gas had been previously administered said that as to the pleasantness of the anæsthesia there was little to choose between the two. As to the open method, he found it very difficult to induce satisfactory anæsthesia in a short time, and on that account alone he adopted the closed method with the modified "Clover." It was, however, a process of evolution, as he endeavoued to indicate in the paper. He believed that, contrasted with nitrous oxide, pental was an unsafe anæsthetic ; but in the country more particularly, chloroform was so frequently given by medical men—even for one extraction—that he thought in an anæsthetic like pental they had an agent that could very satisfactorily replace chloroform. He had never tried it for a long operation, although he fully believed that for certain operations, even with a duration of half-an-hour, pental would be found satisfactory. He had endeavoured to place the facts before the Society without any bias, and from those facts he hoped members had been able to draw their own conclusions.

A formal vote of thanks was given to the reader of the paper, and to those who had brought forward casual communications.

LIVERPOOL DENTAL STUDENTS' SOCIETY.

The ordinary General Meeting of this Society was held on Friday, February 16th. Mr. Phillips in the chair.

In response to the President's call for Casual Communications, Mr. Kaiser shewed two right upper and lower wisdom teeth from a young woman, aged 20 years. Both were four-rooted, one root in each case being of large size.

Mr. J. Woods exhibited some fossil sharks' teeth, and a large pair of boars' canines.

Mr. J. Pidgeon shewed a dilacerated upper bicuspid. The crown was small and ill-formed, and the root the ordinary size of a normal bicuspid root. The junction between the crown and root was exceedingly abrupt, being marked by a broad ledge where the diameter of the root was greater than that of the crown.

Mr. Fred Rose related a case in which the inflamed pulp of an impacted lower wisdom tooth had given rise to symptoms which had caused suspicions of malignant disease. He had attempted to extract the tooth under chloroform, but had only succeeded in removing the crown. This, however, had up to the time of speaking relieved the pain.

Messrs. C. J. Luyle, L.D.S. Ed., Maskell, Field, Shore, Jeffery, Nixon, and Wilson were then elected members of the Society.

Mr. Phillips then called upon Mr. Snape for his paper on "Dental Caries," which we published on April 2nd.

DISCUSSION.

Mr. J. A. WOODS thought Mr. Snape was mistaken in saying that dentine was more rapidly attacked than enamel; that he had omitted to mention the relative liability to caries of the upper and lower teeth. He would like to know what Mr. Snape thought of the possibility or otherwise of the fluctuation of lime-salts in tooth tissues. He considered that the translucent zone was caused by decalcification of the dentine surrounding the tubules. He recommended medicinal treatment of the oral secretions as a preventative of caries.

Mr. KAISER disagreed with Mr. Woods about the relative rapidity with which dentine and enamel were attacked. It was only necessary to observe the amount of enamel overhanging the edges of a cavity formed by destruction of the dentine to be convinced that it was the dentine which was the more quickly disintegrated.

Mr. NEWTON said that a great deal of caries was caused by overcrowding. He considered that the reason of the immunity of savage races from caries was their manner of tearing partially cooked meat to pieces with their teeth, which expanded the dental arch and prevented overcrowding.

Mr. CAPON considered the translucent zone to be a layer of infected dentine investing that part of the dentine which was already carious. He strongly advised careful dieting of children, with a special view to the assimilation of lime salts. Referring to the sudden change by which teeth, previously healthy, became carious, he thought this was very probably due to the abstraction of lime salts from their substance.

Mr. PIDGEON had found caries most prevalent in the first dentition, in which the calcification was not so complete as in the permanent set. He thought that caries was decidedly infectious, as in interstitial cavities he almost invariably found that when one surface was attacked, that there was always more or less caries in the one approximating it. He considered artificial dentures a fruitful cause of decay, and made a point of not advising them for merely æsthetic purposes. A gentleman had recently consulted him who required a plate with one tooth on each side, the want of which he said was injuring his digestion. He made this, using no clasps, but within twelve months found all the teeth touched by the plate softening. On the disuse of the plate, the teeth in a few months were found to be harder, and the progress of the disease arrested. Was this hardening of the enamel due to the deposition of lime-salts? Again, the softening and subsequent recovery of the teeth in growing children and pregnant women was, he considered, a proof of some vital action having the power of laying down more limesalts as required.

Mr. Parsons advised constant supervision of children's teeth, in order to prevent overcrowding. He considered it a matter of great importance to frequently wash dentures, as, even in those plates whose fit prevents the accumulation of food under them, there is the constant shedding of epithelial debris from the oral mucous membrane to be considered. Among other causes of caries he enumerated regulation cases, and the accumulation of tartar round the necks of the teeth, causing recession of the gum. He advocated the use of alkaline mouth washes in any case which showed evidence of a predisposition to caries.

Mr. Edwards disbelieved in the possibility of any fluctuation of the degree of calcification in tooth tissues, as in them there is no circulatory system capable of adding or abstracting lime-salts. He believed that the re-hardening Mr. Pidgeon spoke of was the result of the removal of softened debris.

Mr. Coysh thought no difficulty exists in allowing that re-calcification is possible if we admit the present theories of calcification He thought it quite likely that a deposition of lime-salts might take place, not in the already carious dentine, but in the translucent zone. He agreed with Mr. Parsons that the use of alkaline tooth powders was beneficial, but considered that he exaggerated the mischievous effects of the presence of tartar, as that substance being composed chiefly of alkaline earths, would exercise a controlling influence on any acid fermentations.

Mr. Bates said that in his opinion a great deal of mischief is caused by the use of unsuitable tooth-brushes and powders. That the more gently the gums were treated the worse was their condition. He advised the unsparing use of stiff tooth-brushes, not the soft ones so commonly used. He thought that the use of carbolic tooth-powders destroyed the enamel.

Mr. **Lewis Osborn** said that several of the carbolic tooth-powders that had come under his notice were not only very strongly impregnated with carbolic acid, but were very gritty, and so calculated to injure the enamel.

Mr. **Snape**, in replying briefly, said that carbolic acid was not, strictly speaking, an acid at all, and had no effect on the enamel.

The proceedings then terminated with the usual vote of thanks.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The usual monthly meeting of this Society was heldon Friday, March 2nd, C. W. Glassington, Esq., President, in the chair.

The minutes of the previous meeting were read and confirmed, and the President gave the usual welcome to the visitors present.

Messrs. Everett and Hill were balloted for and unanimously elected members of the Society.

Casual Communications.

Mr. **Burroughs** showed a case of gemination in a temporary lower central and lateral. They each had a distinct pulp and were joined together by cementum.

Mr. **Greetham** passed round a model showing supernumerary teeth in the incisor series, thus proving the necessity of having children's teeth periodically examined—preventing the teeth from being overcrowded, and allowing the permanent teeth to fall into their normal position.

Mr. **McFarlane** showed a new automatic blowpipe, consisting of an air-pump and reservoir, the pump being worked either by the hand or foot. There are two great advantages in it—it has no bellows to burst, and only costs about half as much as the ordinary foot bellows.

Mr. **Farmer** suggested the formation of a microscopical branch of the Society. He thought that a great deal was to be learned by making sections of erratic teeth and examining then microscopically.

Mr. **Spokes** suggested that sections might be placed under microscopes, and the subjects announced during the meeting by the members so presenting them. At the close of the meeting the specimens might be examined by those interested.

Mr. Glassington thought the proposal a good one

Mr. Spencer, F.R.C.S., then gave an address on the "Tempero-maxillary Articulation."which we pubiish on April 2nd.

Mr. Spokes and Mr. H. G. Read discussed the various points in the address, and Mr. Spencer having replied, Mr. Glassington proposed a vote of thanks to him, which was very heartily responded to, and the meeting then adjourned.

MANCHESTER ODONTOLOGICAL SOCIETY.

The usual monthly meeting of the Society was held at the Victoria Dental Hospital, Devonshire Street, on the 6th March, the President, Mr. W. Murphy, presiding.

Casual Communications.

Mr. T. E. Sherratt exhibited a central incisor he had extracted from a patient, a boy eleven years of age. Through a fall a tooth had been fractured throughout its whole length, and although the two halves of the tooth moved freely upon each other, the patient suffered no pain or inconvenience.

The late Mr. S. A. Rogers, of Manchester.

The President brought to the notice of the Society the death of Mr. S A. Rogers, formerly in practice in Manchester, and one of their honorary members.

Mr. Mansell proposed, and Mr. Whittaker seconded a resolution of condolence with the family of the late Mr. Rogers, and expressing the high esteem in which he was held by the members of the dental profession. This resolution was carried unanimously.

Demonstrations, &c.

Mr. I. Renshaw inserted a Buttner Crown in an upper incisor root, commencing and completing the operation at the one sitting. The root was ground down above the gum level, and the mineral tooth fitted on the top of the gold cap, leaving no projecting edge. When inserted the junction between the gold and mineral tooth was completely concealed by the overhanging gum.

Mr. Minshall undertook at short notice the demonstration of crystal gold filling. The cavity selected was on the crown of a right upper molar, the gold used being White's crystal gold. Hand pressure and the automatic mallet were used in condensing the gold, and the result was a hard plug which finished off with a good surface.

Mr. H. T. Dreschfeld showed an interesting case of "Osteoma of the superior maxilla," and also models of a case of "Hypertrophy of the gums."

STUDENTS' SOCIETY, VICTORIA DENTAL HOSPITAL, MANCHESTER.

Sixth General Meeting, Tuesday, March 19th, 1894. The President, Mr. F. W. Minshall, in the chair.

The minutes of the previous meeting were read and confirmed unanimously.

Casual Communication.

Mr. J. Wood passed round a model showing a supernumary in the incisor region.

The Secretary announced the receipt of a humorous menu card, sent by the Students' Society of the Edinburgh Dental School.

The President then called upon Mr. Booth to read a paper on "Pyorrhœa Alveolaris," which we publish at page 346.

Mr. Minshall, in opening the discussion, referred to the scant knowledge which the dental profession possessed of this peculiar disease. He himself wished that it was a disease which could be more readily differentiated and separated by some well-marked features from other similar classes of dental affections. His personal experience of these afflictions was limited, and he was afraid that the treatment he had adopted for them would be considered more or less empirical by some of the members present. The method pursued consisted in syringing out the sulci with some antiseptic lotion, and then packing them with copper sulphide. But all these means would not in his opinion cure, though it would undoubtedly minimise the progress of the disease, and in the majority of cases would only delay for a more or less distant period the necessity of extracting the offending tooth or teeth.

Mr. D. Headridge thanked Mr. Booth for his excellent paper. In the course of his remarks he defined Pyorrhœa Alveolaris as a certain distinctive disease mixed up with many other diseases of the gums and periodontal membrane though quite distinct from other inflammations of that membrane. Its distinctive character was exhibited by the excessive quantity of pus secreted round the necks of the teeth, and unless this be present it could not be called a case of true pyorrhœa alveolaris. With regard to its causation he entirely concurred with the views held in the thesis. The bacilli found were not pathogonomic of the disease in his opinion.

Passing on to its treatment he considered that little could be done. He confessed that he had tried everything possible only to meet with failure in the end. For palliative measures he had found copper sulphate of great benefit. Silver nitrate was better in some cases. Chloride of zinc if given as a mouth wash would probably be of use, as after using it the pus is reduced in quantity. Finally in very bad cases where the teeth were very loose, he recommended ligaturing the teeth together with gold wire drawn out very fine.

Mr. Booth thanked the members present for the attention given his paper and commented on the discussion.

The President then called on Mr. Bellaby for a paper on "Fractures of the Inferior Maxilla" which we publish at page 354.

Mr. J. A. Lees in opening the discussion said that he had been pleased with the paper just read by Mr. Bellaby. He was afraid that his limited experience of the subject would preclude him taking a large share in the discussion, yet he would like to point out the usefulness of interdental splints. He thought their application was to be regarded as a distinct advance in treating fractures, and by far the most efficient procedure worth adopting for these cases.

Mr. D. Headridge thought that the essayist had laid too much stress on the advantages of the four-tailed bandage, He himself contended that it was useless and even dangerous in the majority of cases, as it would produce sliding of the fragments on one another.

He preferred the Hammond splint to all others, providing it was well fitted. To do this perfectly he recommended the use of a metal die to fit it in pressing the wire well in the spaces between the teeth. In practice he did not believe in passing the binding wire round the necks of the teeth in the manner described by Mr. Bellaby as this proceeding was very difficult to perform at the back of the mouth; passing the wire between the teeth only and turning the ends round the frame was quite sufficient.

Mr. Bellaby said a few words in reply thanking the gentlemen present for the discussion.

The meeting then terminated.

APPOINTMENTS.

Mr. J. Percy Smith, M.R C.S., L.D.S., has been elected Assistant Dental Surgeon to the Dental Hospital of London, Leicester Square.

Mr. J. Trevor Hankey, L.D.S. Eng., has been elected Dental Surgeon to the Brentwood Schools of the Hackney Board of Guardians.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications : name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only ; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
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THE RELATION BETWEEN AFFECTIONS OF THE TEETH AND OF THE EYES.

By Dr. N. Feuer, (of Budapest).

Translated by Sydney Stephenson, M.B., Surgeon to the Ophthalmic School, Hanwell, W.

There is a common idea that mischief can spread from the teeth to the eyes. Every inflammation of the latter occurring at the time of dentition* is popularly assigned to the teeth; and it is thought that the "eye-teeth" are especially dangerous, not only during their eruption, but also during their decay. The modern physician has always a sceptical smile when this time-worn belief is mentioned. Yet the important nervous and vascular ties binding together teeth and eyes, show clearly enough that a certain pathological relationship between those organs is no more than might be expected; while the knowledge we possess concerning reflex affections in other parts of the body must incline us to a belief in the reality of such a connection. In point of fact, altogether apart from the numerous earlier communications, a considerable amount of literature has made its appearance in modern times upon this subject. These cases, despite their incompleteness in some instances, cannot be altogether ignored, because of their number, and also because of the high scientific position of some of their authors. The connection, however, is only one-sided, i.e. diseases of the teeth may well give rise to affections of the eye, but the reverse process has not been recorded hitherto. Considering the enormous number of persons with diseased teeth, it is somewhat singular that affections of the eye are not more frequently observed. Anyhow, such cases, by reason of their great importance, should have more attention paid to them than has been done up to the present time, a remark that applies to dentist and to oculist alike.

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* "Children are frequently distressed with sore eyes while teething, and the ophthalmia induced seldom subsides until the pain in the gums be removed. This effect is in part the result of sympathy, but is chiefly occasioned by irradiation communicated directly to the eye by the maxillary branch of the fifth pair of nerves. Even among grown up persons, the irritation of a carious tooth not infrequently induces pain and inflammation in the eye of the affected side." (A Treatise on the Varieties and Consequences of Ophthalmia, by Arthur Edmonston, M.D., 1806, page 208) Trans.

It would be a useless as well as a barren undertaking, to review here the whole of the literature bearing upon the subject (of which Forster[1] remarked that it was more voluminous) than profound), nor would our object be obtained by criticising the scientific value of those publications. It will suffice to lay before the reader a general survey ; to indicate to him the standpoint from which our own observations, and those gathered from other sources are to be judged ; and, lastly, to quote particular cases in explanation of our remarks.

In the course of the following chapters, an opportunity will be found to discuss the differential diagnosis between high-seated dental fistula, on the one hand, and fistula resulting from retro-bulbar abscess, dacro-cystitis, periostitis and caries of the orbital margin, on the other.

The affections of the eye that follow upon diseases of the teeth may be divided into two groups. First, those affections transmitted by continuity from the region of the teeth to the eyes or to their surroundings ; secondly, such diseases of the eye as are called forth reflexly.

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[1] Graefe-Saemisch Handb. d. ges. Augenhlkd., iii. Bd., p. 72.

FIRST GROUP : AFFECTIONS BY CONTINUITY.

This group is not only the more definite, but also the more serious. It has reference not so much to that common everyday appearance associated with dental periostitis of the upper jaw—where swelling of the cheek and eyelids is accompanied by collateral hyperæmia of the conjunctiva, marked by lacrymation and secretion—as to a far more serious condition, namely, cellulitis of the orbit. The latter affection sometimes makes its appearance after dental manipulations. The purulent, possibly septic condition thus brought about in the upper jaw creeps upwards to the orbit, where it excites inflammation of the retro-bulbar cellular tissue, a process followed in most cases by destruction of the eye. When we add to this, that life itself may be placed in jeopardy, the importance of this group, in so far as the dentist is concerned will be sufficiently indicated.

As already stated, the leading symptom is suppuration, which spreads to the periosteum of the orbit from the tooth-socket or from the alveolar process of the upper jaw. The process passes through the lymph vessels (Pagenstecher) or through the veins, that is, it spreads by a lymphangitis or by a phlebitis. Two courses are open : (1) directly along the periosteum of the cheek, (2) through the antrum of Highmore. As regards the latter, the infection-germ may gain access to the maxillary sinus either through the alveolar veins, or by means of an open communication between alveolus and antrum. From antrum to orbit, two paths are available. The first way is by a large venous branch, which perforates the outer wall of the superior maxilla to discharge itself directly into the vena ophthalmica-facialis.

From there the phlebitis can pass upwards to the spheno-maxillary fossa, and, by means of a venous anastomosis, through the inferior orbital fissure to the ophthalmic veins, inferior and superior. The second way out of the antrum is by a small vein, which bores through the lower wall of the orbit, and opens directly into the vena infraorbitalis or into other veins from which the vena ophthalmica inferior arises. (Vossius,[2] compare also Parinaud.[3])

Incidentally we may here note that primary inflammation of the maxillary sinus, or inflammation originating from the nasal mucous membrane, can give rise to retro-bulbar cellulitis. This was so in cases reported by Brück[4], (who certainly did not examine the teeth closely,) and by Herman Pagenstecher[5].

Because suppuration is transmitted from alveolar process to antrum, it does not necessarily follow that septic mischief is present. Even a so-called simple suppuration, if the pus finds no free vent, can bring us face to face with this grave emergency. In those instances where retro-bulbar inflammation made its appearance before extraction of teeth (two-thirds of the published cases), we must regard sepsis as at least doubtful. Again, although it is true that in most of the recorded cases the corresponding half of the face was swollen, yet in numerous other instances this bridge of connection between the teeth and the orbit was absent, or at least not obvious. This was so in both the cases recorded by Pagenstecher[5], the first of whose observations possessed especial interest, since the primary dental affection was so slight as scarcely to admit of diagnosis. Extraction of the affected tooth, undertaken in opposition to the views of the dentist, and at the express wish of Pagenstecher, was followed, however, by a speedy improvement in the retro-bulbar inflammation.

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[2] Graefe's Arch. für Ophth. Bd. xxx., Abth., 3, p. 157.

[3] Parinaud, Arch. gen. de Med., Juin, 1880, und Deutsche Monatschrift fur Zahnheilk, 1884, p. 137.

[4] Brück. Casper's Wochenschr. für geo. Heilk, 1851, p. 129.

[5] Pagenstecher. Knapp's Arch. für Augenheilk, 1884, p. 138.

Violent inflammation following tooth-extraction is to be ascribed to septic infection so much the more readily as retention of matter is here out of the question. Further, the dentist cannot always be held responsible for the infection, seeing that the patient himself may have introduced septic germs into the wound by various ways, for example, by fingering or by food. Moreover, as hinted before, in only a third of the published cases had extraction taken place before the retro-bulbar disease was evident. The time that elapsed between the two events ranged from two to ten days. In only a single case recorded by Sovet,[6] did periostitis, present before operation, protract itself so long after extraction of the tooth that two months passed before inflammatory exophthalmus declared itself. It should be noted that fragments of the maxilla were removed during extraction of the tooth.

The exophthalmus observed in Sovet's case was explained by a periostitis of the orbit leading to retro-bulbar cellulitis. Pus escaped both from orbit and from nose; at the end of a month a sequestrum, as large as a pea, was thrown off, and a piece of dead bone came from the nose; finally the eye atrophied as the direct result of the disease. We may remark, however, that the inflammatory process seems to have been of a chronic nature.

In those instances where apart from operative interference, the dental condition caused cellulitis, extraction of the affected tooth invariably brought about a rapid improvement in the retro-bulbar trouble, as well as a speedy retro-

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6. Sovet. Ann. d' ocul, 1847. Bd. xviii., p. 159.

gression of the associated exophthalmus. Where external swelling did not already betray the existence of an alveolar abscess, its presence was confirmed on subsequent extraction of the teeth.

Most of the recorded cases of cellulitis terminated in suppuration behind the eye. The pus collected either in the lower lid or in the palpebral fissure; or, by perforation of the lamina papyracea, it passed into the nose, and eventually into the maxillary sinus. Sometimes (as in Sovet's case) dead bone came away from the maxilla, as well as from the orbital wall.

After timely removal of diseased teeth, retro-bulbar inflammation, in a few instances, subsided without either formation of pus or damage to sight.

The formation of matter always involves a serious risk to the eye. Thus in nearly one half of the recorded cases, cellulitis was followed by white atrophy of the optic nerve and total blindness, a result that has also been observed not infrequently as a sequel to facial erysipelas. Nor is the tale complete; for inflammation may extend over the retina to the uveal tract, and thereby lead to complete shrinking of the eye.

In Brück's case, which has been mentioned before, the sight, altogether lost at first, returned to some extent later, although it was not sufficient for the estimation of distances.

But the evil consequences entailed by retro-bulbar cellulitis are not yet exhausted; death itself may result from extension of the process, especially of the phlebitis, to the membranes of the brain. Indeed, among some 26 cases, death has been recorded no less than four times (Fischer,[7] Teierlink[8] Foucher[9], and Snell.[10])

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7. Fischer. Klin, Unterricht in der Augenheilk, Prag. 1832, p. 9.

8. Teierlink. Ann. de la Soc. de Med. de Gand, Janv. 1848, & Anns. d'ocul., 1848, p. 92, 151, 198.

9. Foucher. Gaz. des Hôp., 1856, p. 35.

The treatment of cellulitis is to be conducted in accordance with ordinary surgical principles. If a tooth has been extracted, the wound should be thoroughly disinfected; any collection of pus in the alveolar process, on the jawbone, or in the antrum, must be evacuated, the opening being kept patent and sedulously rinsed out with an active antiseptic: loose pieces of bone should be removed at once. A diseased tooth still in its socket should be extracted forthwith, and the sooner that is done, the more rapidly will cellulitis subside. The

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10. Snell. The Lancet, 1890, p. 127.

1. Snell's case of fatal cellulitis is so well recorded as to warrant more than mere passing mention. Its material facts are these.

On January 24, 1890, Miss B, 14 years of age, had the three roots of the first superior right molar and the first inferior left molar extracted. Fœtid pus escaped after removal of the former tooth. Five days later the second superior right bicuspid and the first inferior right molar were removed. Acute periodontitis of the bicuspid was noted.

On February 2, 1890, the weather being cold at the time, the patient went for a drive in an open trap; on the next day she resumed school work, from which she had been absent for two weeks. Headache and vomiting set in upon Feb. 6th.; and three days later, a swelling was noticed, involving the region of the right eye.

Mr. Snell saw Miss B. for the first time on Feb. 16, when her condition was as follows: considerable œdema of the lids of the right eye and of neighbouring parts; right eyeball decidedly protruded; conjunctiva swollen, particularly at the outer commissure. Severe pain was complained of. A diagnosis of acute cellulitis was made.

On Feb. 18, fluctuation was found to be present at the lower and inner part of the right orbit, and a large quantity of pus was evacuated through an incision beneath the inner third ofthe lower eyelid. A drainage tube was inserted into the wound. A probe disclosed the existence of bare bone in the depths ofthe orbit Next day patient free from pain, and eyeball in normal position. Upon the same night, however, Miss B. became worse; vomiting set in, and occurred whenever she attempted to swallow anything. Next morning, she complained of great pain at the back of the head, which was retracted. She became comatose the same evening, and died next day, (21st) at 3 p.m. A post-mortem examination was refused, but Snell noted that "the condition of orbit was quite satisfactory; the œdema and swelling of lids and other parts had disappeared, the eyeball had returned to its natural position." (Trans. ophth. Society, Vol. X, p. 51 et seq.) Trans.

2. The English reader will find a full account of Fischer's Case in Mackenzie's "Treatise on the Diseases of the Eye," 4th edition, page 303. et seq. Trans.

special treatment of the latter affection devolves of course upon the ophthalmic surgeon, whose endeavour it should be to evacuate deeply-seated collections of pus at the earliest possible moment, and to seize and remove dead bone as speedily as possible. The fate of the eye, nay even life itself depends upon the rapid resolution of the retro-bulbar inflammation.

It would be absurd, of course, to ascribe to a dental origin every inflammation of the orbit that might chance to appear in those with diseased teeth. We know that idiopathic cellulitis generally runs its course in two or three weeks. Suppose, now, that late in the history of such a case, one or more decayed teeth were removed, and that the operation was followed by speedy convalescence. It might be concluded that, under such circumstances, the carious tooth stood in causal relation to the cellulitis, an inference, however, that would not be justified by the facts. In the absence of an obvious connection between the affection of the teeth and that of the orbit,) be it in the form of a swelling of the cheek, or of an abscess of the antrum,) then suppuration at the root of the incriminated tooth must at the least be demonstrated, in order to maintain with some show of reason that there is a real relation between the two conditions. As a matter of actual practice, however, one would, even on mere suspicion, extract any teeth that might appear to be implicated.

In addition to the authors already quoted, the following report upon retro-bulbar inflammation of dental origin: Galenzowsky[11], Decaisne[12] (two cases), Tetzer[13], Gaine[14],

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11. Galenzowsky. Arch. gen. de Med. Bd. xxiii., p. 2161. Paris, 1830.
12. Decaisne. Bull. de l'acad. royale de Belg, 1853, Bd. xiii., p. 53.
13. Tetzer. Bericht der Wiener Unworsitäts-Augenklinik, 1863, p. 116.
14. Gaine. British Med. Journal, 1865, p. 683.

Williams[15], Salter,[16] (who also quotes a case by Pollock), Delestre[17], Le Fort,[18] Sammelsohn[19], Weinberg[20], Vossius[21], and Hern (see Collins)[22]

(*To be continued.*)

A New Use for Eau de Cologne.—Dr. Roux recently addressed the Medical Society of Lyons in favour of the use of eau de Cologne as a remedy in incipient coughs and colds. A number of his patients have been able to stop colds in twenty-four hours by inhaling eau de Cologne from a pocket-handkerchief through the mouth or nostrils, according as the part affected is the chest or head. A disagreeable burning sensation is experienced at first, but this soon passes away, Dr. Roux is puzzled to know which of the many ingredients of eau de Cologne produces the effect. He is pursuing his researches and hopes to be able to give a plausible solution before long. He is certain that alcohol alone will not produce the result.

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[15] Williams. Dental Cosmos, 1867 (auch bei Wedl., Pathol. der Zahne, 1870, p.169.)

[16] Salter. Med. Chir. Transactions, 1863. Guy's Hospital Reports, 1867. (Compare Wedl., p. 170).

[17] Delestre. Bull. de l'acad, de Med, 1869 p. 112 ; des Accidents causes. par l'extraction des dents, Paris, 1870, p. 87, & Gaz. Med. de Paris, 1871, p. 150.

[18] Le Fort. France Medic. 1876, Nr. 44, p. 357.

[19] Sammelsohn. Berliner klin. Wochenschr., 1877, p. 752.

[20] Weinberg. Rec. d'ophth., 1882, p. 441, 677.

[21] Vossius. Graefe's Arch. für ophth. Bd. xxx. Abth. 3, p. 157.

[22] Collins. British Journal of Dental Science, April 15, 1891. Odont, Gesellsch. von Gr. Brit., Märzsitzung (see Correspondenzblatt fur Zahuärzte, 1891, p. 262.

THE ACTION OF CORROSIVE SUBLIMATE ON THE EXPOSED PULP.

By R. Denison Pedley, F.R.C.S., Ed., L.D.S. Eng.

Ever since Dr. Miller published the results of his remarkable experiments on "The Comparative value of Antiseptics," dental practitioners have hoped to find in corrosive sublimate an ideal drug for rendering the contents of the pulp chamber aseptic ; and many have asked "Is it possible to do in practice what Dr. Miller has done in the laboratory, not only to render nerve pulps aseptic, but to turn them into a leathery mass ?" This indeed seems to be an ideal worth working for, as it is no exaggeration to say that the busy practitioner spends his most laborious hours over teeth, the pulps of which he feels compelled to destroy and remove.

With a view of testing the value of the drug, at the same time endeavouring to answer the important question, I commenced a series of experiments. It seemed desirable in using corrosive sublimate ($Hg\,Cl_2$), to start with it alone, and several cases were treated, where an exposed nerve was found, by applying $H_{g.}\,Cl_2$ instead of arsenic.

The results were published in August, 1891,* showing that it was quite possible to destroy the vitality of the pulp by the aid of $Hg.\,Cl_2$, though the process was somewhat slower, and more painful than with the usual application of an arsenical dressing. It is true that a much larger quantity of $Hg.\,Cl_2$ was applied in these cases, than one is accustomed to use of arsenic, viz. $\frac{1}{6}$ to $\frac{1}{16}$ gr., but subsequent experience even with a smaller quantity only confirmed the above-mentioned fact, that for destroying the vitality of a pulp, $H_{g.}\,Cl_2$ was extremely painful, notwithstanding the admixture of cocaine or morphia.

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* Vide B. D. A. Journal, Aug., 1891.

It was decided to destroy the vitality of the pulp in the usual way, and then to apply $H_{g.}$ Cl_2. The method adopted was, first, the application of arsenic after free exposure, and the determination of loss of vitality by puncture with a nerve bristle. From $\frac{1}{16}$ to $\frac{1}{6}$ grain of powdered $H_{g.}Cl_2$ on a wisp of cotton was then carefully placed on the exposed pulp, a disc of card over this, and the tooth was filled with soft gutta-percha. Upper and lower molars were chosen in healthy patients.

In the first series of cases, the drug was applied so soon as the pulp seemed insensitive. The effect was curious, for within an hour or two great pain was experienced, so much so that in two instances the patients insisted on the removal of the teeth; in the remaining four the pain passed away within 24 hours, leaving the teeth rather tender to bite upon.

The immediate application of $H_{g.}$ Cl_2 was abandoned and the following method adopted. On removal of the arsenical dressing, the pulp was swabbed with a solution of $H_{g.}$ Cl_2 in spirit, 1 in 500. The pulp was covered with a disc of card dipped in the same solution. The tooth was filled with gutta percha, and 14 to 21 days was allowed to elapse. The gutta percha filling was removed, $\frac{1}{16}$ to $\frac{1}{8}$ gr. $H_{g.}$ Cl_2 was applied and the tooth filled again with a hard gutta percha or osteo. No acute pain was experienced, though occasionally a dull aching, followed by slight tenderness on biting, was complained of.

A number of teeth have been treated in this way and from one week to two years have been allowed to elapse before the stoppings have been removed and the contents of the pulp chamber and nerve canals examined. The results may be expressed in a few words. In lower molars the action of $Hg.Cl_2$ seemed more satisfactory than in upper molars.

The pulps were always dark in colour, and after 6 months the tooth substance was deeply stained. In several teeth the pulp was found dry and leathery. In the majority of teeth the pulps were found quite moist. Occasionally the nerves from the posterior fangs of lower molars were dry and leathery. Those from the upper palatal fang were invariably moist.

Whether the teeth were filled with gutta percha or osteo there was no apparent difference in the condition of the pulp or the canals. In teeth which were opened up after two years, the pulp and nerves were as moist as those opened up after two weeks.

I am willing to admit that there may be some better methods adopted for securing better results than I have obtained : but the general impression gained is one of dissatisfaction. It seems quite possible to render the contents of the pulp-chamber and nerve canals aseptic but experience has taught me that there is more or less uneasiness in biting on a tooth containing a pulp treated in this way, and that whenever uneasiness was marked the pulp and nerve were in a moist condition.

ERUPTION OF TEETH BEFORE BIRTH.

By A. J. Cardell, L.D.S. Eng.

Seeing that there are comparatively few cases of "Teeth at Birth" recorded, and that such cases, when they do occur, seldom receive other notice than that of the doctor or the nurse, I thought it might be of some interest to note one which has come under observation.

The mother, an unmarried woman, æt 22, of an anæmic appearance, brought her baby, a girl aged 5 weeks, who at birth had two teeth in the region of the lower central incisors. One of these I removed as it was so very prominent and loose as to interfere with the act of suckling. The other one, which was only half erupted and pretty firmly attached, I decided to leave in for a time, as it appeared to give no inconvenience to either mother or child, and partly on account of the former's strong desire not to have it touched.

The tooth in my possession presents the appearance of a thin hollow translucent cap of enamel about the thickness of stout note paper, is wedge-shaped somewhat like an upper lateral incisor and stops short at the neck where it is markedly constricted ; the whole of the outer surface is covered with an irregular calcareous deposit. The cingulum is represented by a rounded prominence elongated towards the mesial side which brings the depression more than half way up the lingual surface when it becomes slightly concave, terminating in a thin cutting edge upon which four or five little cusps may be distinguished under the magnifying glass ; upon its labial aspect which is slightly convex there are slight indications of transverse ridges. The internal surface of the shell is quite smooth and corresponds with its periphery, the walls are of universal thickness.

The dimensions of the tooth are length $\frac{7}{32}$ in, breadth $\frac{1}{8}$ in.

With respect to the influence of any constitutional factor upon premature eruption it may be remarked that the child itself is healthy and otherwise in a normal condition as regards its hair and nails.

There is no account of any similar irregularity on the mother's side. The child's mother never had an illness in her life, and there is no history of specific or other diseases.

British Journal of Dental Science.

LONDON, MAY 1st, 1894.

THE FRENCH DENTAL SCHOOLS.

This time last year we drew attention to the position of dentistry in France, and, in view of the criticism passed upon the Dental Schools, ventured to express the hope that differences of opinion, which had unfortunately arisen amongst some of the leaders in educational matters, would be adjusted in order to meet successfully the requirements of the new Dental Act. We are glad to find that past misunderstandings, which at one time reached such an acute stage as to lead to legal proceedings, have apparently been smoothed over, and that an approach to unanimity prevails.

A further decree, a corrollary of the new Act,was published last July dealing with the curriculum for students,and the subjects for the examination of those who wish to obtain the diploma of dentist. There is the additional question as to the organisation of the necessary teaching, and on behalf of the present dental schools a report has been presented by M. P. Dubois, to the Managing Committee of *l'Ecole Dentaire de Paris.* It expresses the views of a commission which has been considering the matter, and it may be regarded as "The Brief for the independent Dental Schools." It contains the views of several influential witnesses, which serve as rebutting evidence to the strictures pronounced by M. Magitot, that we drew attention to, twelve months ago. M. Brouadel, for instance, refers to the wisdom of continuing and imitating the methods initiated by the existing schools, and another medical witness, M. Cornil, is quoted to the effect that they really provide the theoretical and practical knowledge demanded from the candidates for the dental diploma. It is pointed out that the existing schools have already exercised considerable influence; they have brought about a spontaneous regulation of the dental art by securing public recognition, and what they have done on their own responsibility in the past, can be continued under the new legal enactments. They wish for nothing better than to be allowed to adapt themselves to the new state of things, by enlarging their scheme, and by offering all the assurances which the authorities may demand. The only stipulation they make is that the teaching shall remain in professional hands, and that the results of fifteen years of work shall not be negatived. The difficulties of relegating the teaching to a University Faculty are also alluded to. M. Dubois thinks it is reasonable to admit that however well the theoretical courses might be arranged, the only way the State could supplement these by practical teaching would be by the establishment of a special school at a great and unnecessary expenditure. In regard to the teaching at general hospitals, it is held that although this suggestion proves attractive to those who regard medicine and dentistry as one, yet experience shows the hospital is not the best place for dental practice and teaching. Urgent treatment and palliative remedies may have a place, but not the conservative treatment of teeth affected by complicated caries. According to this view the hospital dental surgeons cannot allow one chair to be occupied by a single patient for a long time, and whilst they can render services to patients, they cannot give the instruction required by dental students. Some rather severe criticism appears in the report, to the application of which in this country exception would certainly be taken. It is suggested, or rather asserted, that the general surgeons do not find their dental colleagues give them the assistance they desire in cases of facial restoration or of fractures of the jaw. When discussing the teaching in special dental hospitals allusion is made to the English and American Schools. We cannot help thinking that a too sweeping generalisation is made in describing the latter as the property of certain dentists, associated for the purpose of getting money from the students' and patients' fees.

We gather that the majority of the Commission admit that dissections, practical physiology and general pathology might be taken much as they are in England, at the general hospitals. So long as the State controls the curriculum and examinations, other matters, we think, would tend to arrange themselves, for candidates soon discover where best they may obtain the necessary teaching.

An Impacted Denture.—At a meeting last month, of the Liverpool Medical Institution, Mr. Arthur Wilson communicated the details of a case in which a fatal result followed an operation to remove a plate from the gullet. The patient was a man aged sixty-five. All efforts to extract it in the ordinary way failed, and therefore œsophagotomy was performed twelve hours after the accident. It seems that a clasp had become firmly embedded in the posterior wall, and rendered the procedure very difficult. The plate was finally freed by two pairs of dissecting forceps, and the patient was afterwards regularly fed through a soft rubber tube passed from the mouth. The only unfavourable symptom was continued rapid breathing after the operation, but the patient died from exhaustion on the fourth day. The question was raised as to the advisability of using a tube for feeding in the after-treatment, and whether it should be passed by the mouth, the nose, or through the wound.

Deaths under Chloroform.—A fatal case is recorded from the Bristol Royal Infirmary. The patient, a man aged twenty-two, was thin and anæmic. He had previously undergone an operation under an anæsthetic two years before, and was now to have the right elbow-joint excised. The chest was examined immediately before the administration, and the heart showed no abnormal physical signs. Chloroform was used on a double fold of towelling on a wire frame open at the sides. The patient struggled slightly and held his breath. This soon passed off, the patient was still conscious and the pulse quick and full. After three or four minutes, and when less than two drachms of chloroform had been used, he suddenly became cyanosed and the pulse stopped. The breathing was deep and laborious, and the pupils were dilated and fixed. After lowering the head and employing artificial respiration, the breathing improved, but afterwards became stertorous and artificial efforts were continued for half an hour without effect. At the necropsy the brain and heart were found to be normal, but there were a few pleuritic adhesions. Another case is reported from the Bradford Infirmary. The quantity used was three drachms in ten minutes.

TREPHINING IN THE STONE AGE.—Professor Victor Horsley, in a recent lecture, drew attention to the fact that prehistoric people succeeded in carrying out what was even now regarded as a difficult operation. Professor Horsley, who knows something about trephining, seems, however, more interested as to the reasons why the operations were performed, rather than surprised that prehistoric men were able to make holes in their friends' heads. The representations of skulls exhibited showed, by the rounded worm-eaten appearance of the openings made, that the operations were performed during life, and that the patients survived. Further it was found that the holes were generally made at a part immediately above those portions of the brain which if injured would induce fits. Sometimes the piece of bone removed by the flint instrument, was replaced in the skull, and at other times split up into amulets. The dwellers in the Stone Age no doubt regarded the operation as something very special, and considered that the bone removed had supernatural properties.

A Tannin Solvent.—Messrs. Trimble & Peacock have referred, at a meeting of the American Pharmaceutical Association, to the use and value of acetone as a solvent of oak tannins. They were able to extract sixty-two per cent. of solids from powdered nut-galls, whereas commercial ether removed only 59 per cent. The low boiling point of acetone renders its recovery easy and rapid without running the risk of decomposing the tannin. It is a better solvent than alcohol or ether, and extracts the tannin with less admixture of sugar and other carbohydrates. After forty-eight hours maceration, followed by percolation and distillation, a dark brown semi-solid extract is left. This is washed and filtered and anhydrides are precipitated by dilution with more water. The filtrate is agitated with acetic ether, and the tannin thus separated is further treated with ethylic ether, and finally obtained in a nearly pure form in which it is readily and completely soluble in water.

The Fellows of the Royal College of Surgeons.—For some years past there has been an Association of Fellows, and now there is to be a Society. The former body has been especially active in pressing certain reforms upon the Council of the College, and by combined action its members have been instrumental in securing the election, to the Council itself, of Fellows favourable to the views of the Association. From a circular which we have received we learn that a provisional executive committee has been formed with the idea of founding a Society upon the widest and most representative basis, but we gather that the Society has no connection with the Association, and that its formation is, indeed, an attempt to counteract the growing influence of the older established Body. Meetings of the Fellows and of the Members, held at the College, have each declared in favour of the report of the Gresham University Com mission.

The General Medical Council Criticized.—Although somewhat late in the day, *The Medical Press* utters a protest against the action of the General Medical Council in suspending the registration of foreign diplomas. We do not agree with our contemporary that the reason some English dentists were in favour of the Council's action arose from the inconvenience of professional competition of Americans. We have always thought that the memorial to the Council was signed by dentists who represented the Hospitals, Schools, and Students. It was pointed out that a home-grown student might be tempted to leave the present British curriculum, escape his examination in preliminary education, and get a foreign dental diploma entitling him to register before his stay-at-home brother had completed his five years' training. *The Medical Press* does not seem very well acquainted with all the circumstances under which the Dentists' Act was passed. However, it thinks that a very dangerous precedent for action by the Council has been created, "which, if we permitted it to remain unchallenged, might be used in other directions at a future time." Perhaps the latter words may somehow explain this expression of opinion.

Resignations at Westminster Hospital.—It may be remembered that amongst the opening addresses delivered at the Medical Schools last October, the one at Westminster Hospital secured some attention from dentists, in consequence of the disparaging remarks which were made by Dr. Hebb. The matter has apparently been seriously considered by the two dental surgeons attached to the Hospital, for we understand that both Mr. Lloyd Williams and Mr. W.H. Dolamore have felt it necessary to resign their posts as a protest against Dr. Hebb's statement. We regret that such a course should have to be taken. Both gentlemen hold a high position in the dental world, and could not but reflect much honour upon the Institution to which they gave their services.

A Case of Replantation.—It is somewhat difficult to understand how the circulation in the pulp of a replanted tooth becomes restored, but although the result is not the one we should expect, yet a sufficient number of authentic cases have been recorded to warrant a belief in its possibility. At a meeting of the Sheffield Medico-Chirurgical Society Mr. Frank Harrison read the notes of such a case. A central upper incisor which had been knocked out and immediately replaced, at the age of ten years, was removed fifteen years later for æsthetic reasons. The general aspect was that of a healthy tooth and the pulp-chamber contained a perfectly normal pulp. In this case, no doubt, the fact that the tooth was immediately restored to its socket provides a sufficient explanation of the happy result. The pulp had no time to die before being brought into contact with a free vascular supply, probably through a tolerably large apical foramen.

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Emol is a provisional name given to a newly discovered product which in ordinary respects is allied to fuller's earth, but which is distinct from all market varieties of this substance. It is a product found in Perthshire, Scotland, closely associated with serpentine marble, chalcedony, onyx, and copper. It contains steatite and minute traces of lime and oxide of iron. (*British Medical Journal*) When purified it is a soft delicately pink, impalpable powder, which produces no gritty sensation when placed on the tongue. It has a powerful softening effect upon hard lime water, and can be used with warm water as a natural soap, leaving the hands soft and smooth. But constant use of emol as a cleansing agent results in so great a softening of the skin on the hands that they become unfit for use, and this fact has suggested its employment in removing callosities and horny excrescences upon the palms and soles. In this application it was found very successful, a paste being made with water, and thickly applied, resulting in the peeling off in layers of the epidermic masses. *Amer. Soap Journal.*

Manipulative Miscellany.

It is requested that all new instruments or articles which it is wished to have described under this heading, be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being to give practitioners a description of everything new, on its own merits and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

GRANITE FILLING.—Poulson's Cement has been in use for a long time, and those who know by experience what it means to drill out an old filling of this material, when it has been inserted under proper conditions, can speak as to its hardness. One of the drawbacks to its manipulation was due to the necessity of remelting the liquid which has a tendency to crystallize. George Poulson, of Hamburg, has now introduced a new plastic filling material under the description of "Granite Plombe." The powder is supplied in different grades of colour, and it is claimed that the fluid used will not crystallize. We have found that it works very well. As much powder should be worked with a spatula into the mass as is possible without crumbling, and then it may be kneaded with the fingers before insertion into the cavity. We have not found this last recommendation necessary, and perhaps it is more pleasant, from the patients' point of view, to use instruments rather than fingers where possible. Another instruction, which it is well to carry out, is keep the bottles well capped when not in actual use.

Reviews.

Injuries and Diseases of the Jaws. By Christopher Heath, F.R.C.S. Fourth edition. London: J. & A. Churchill, 1894.

This well-known work requires little to be said in its favour. Originally a Jacksonian Prize Essay, it has for many years been regarded as the standard authority upon the subjects with which it deals. Mr. Heath has had the assistance of Mr. Percy Dean in arranging the material for the fourth edition, so as to bring it into more correct relation with modern pathology. For the rest, the author is content to point out that this edition contains the experience of another ten years of active professional life. It is a most valuable book for the dental surgeon, well illustrated, and with a good index.

The Medical Annual, 1894. John Wright & Co., Bristol.

This is the twelfth year of publication, and the book has been prepared by a strong list of contributors. Some fifty pages are devoted to new remedies,and more than five hundred to new treatment. There are also chapters for Sanitary Science, new inventions, &c. The book is extensively illustrated, amongst the articles so treated is that upon Facial Expression as one of the means of Diagnosis and Prognosis in Mental Diseases, which has between thirty and forty vignettes, referred to in the text.

Catching's Compendium. Franklin Printing and Publishing Company, Atlanta, Ga., 1894.

This book presents a collection of practical points in practice brought before the profession during the preceeding year. The present issue gives the results obtained from the journals of six different nations, and the editor has arranged that the next edition will contain the practical results of the dental journals of the world. This will necessitate a slight increase in price, but is not likely, we think, to prevent purchasers from continuing their subscription.

THE use of the lancet is a necessity in some cases of eruption of children's teeth, for instance, when we find the gums badly inflamed and tumid, parts engorged with thick, black blood, in such a case an incision into the gums will give relief; but usually, if the parent is instructed how to care for and nurse the child at this period, there will be little need for the wholesale use of the lance.—D. M. GALLIE.

Abstracts of British & Foreign Journals

THE CONDITIONS WHICH MAKE A SUCCESSFUL PRACTITIONER.

By Charles S. Tomes, F.R.S.

(Abstract of an Inaugural Address.)

I shall not say much of the great strides that have been made, in the education gone through, in the standard of our professional examinations (our students have to pass the same preliminary examination in general education as the general medical students), nor of the progress which legislation has rendered possible in the hindering of irregular forms of practice—this has all been said before *usque ad nauseam;* but will pass at once to point out the conditions which it appears to me are called for to make the successful practitioner. It goes without saying that he must have fully availed himself of his opportunities of study, for which there is now no lack of opportunity, and it would lead me too far afield to discuss the details of that training of hand and brain, but I should like to say a few words on the matter of a training beyond the ordinary routine of dental education. For there is a danger lest, led away by the pride of manipulative dexterity, we underrate directions of study which, to the thoughtless, seem to have little practical outcome.

We have all of us made acquaintance with the self-styled practical man in all grades of society, from the artisan who poisons us with sewer gas, to the politician whose horizon is bounded by the limits of his personal observation, and that none too accurate. Let me quote to you the words of one of the clearest thinkers of our day, Professor Huxley, who thus delivered himself upon the proper scope of education :—

"I often wish that this phrase, applied science, had never been invented, for it suggests that there is a sort of scientific knowledge of direct practical use, which can be studied apart from another sort of scientific knowledge, which is of no practical utility, and which is termed pure science. But there is no greater fallacy than this. What people call applied science is nothing but the application of pure science to particular classes of problems. It consists of deductions from those general principles, established by reasoning and observation, which constitute pure science. No one can safely make these deductions until he has a firm grasp of the principles, and he can obtain that grasp only by personal experience of the operations of observation and of reasoning on which they are founded. Almost all the processes employed in the arts and the manufactures fall within the range either of physics or of chemistry. In order to improve them, one must thoroughly understand them; and no one has a chance of really understanding them unless he has obtained that mastery of principles and that habit of dealing with facts which is given by long-continued and well-directed purely scientific training in the laboratory."

I will not weaken these pregnant words by comment, save only to say that every word which I have quoted is applicable to the training of the dentist, but that as yet we are far behind such an ideal as is there propounded. That scientific habit of mind by which we observe correctly and draw conclusions legitimately is essential, but it is fortunately one which can, to a great extent at all events, be cultivated. But do not suppose that I would allow this wider mental culture to at all take the place of that patient acquisition of manipulative, and I may say, empirical skill. To once more quote Professor Huxley:—"Indeed I am so narrow-minded myself that if I had to choose between two physicians, one who did not know whether a whale is a fish or not, and could not tell gentian from ginger, but did understand the application of the institutes of medicine to his art, while the other, like Tallyrand's doctor, 'knew a little of everything, even a little physic,' with all my love for breadth of culture, I should assuredly consult the latter."

But in real life we are not called upon to make this choice, the man who is greedy of learning in his own special line is rarely—I may say never—content to be ill-informed outside it. But supposing our young aspirant to start fully equipped with such knowledge as the schools can give him, his success is not yet fully assured and there are certain qualities, like all qualities capable of improvement by cultivation, which will serve him in good stead. He must have nerve; not perhaps the nerve of the surgeon in whose hands lie the issues of life and death, but a certain steadiness of nerve which will enable him in the face of his special difficulties to be fully master of all the skill which he possesses, and this will go far towards securing the confidence of the patients. He must be painstaking, for it is inattention to *minutiæ* that, just as in modern surgery, the difference between success and failure lies ; he must be patient, too, in dealing with all the little obstacles which crop up. And he must have tact and a quick judgment of the idiosyncrasies of his patient, which he must be both quick to appreciate, and within proper limits, to bend to. For the very nature of our work precludes the possibility of the patient being able to judge even of results, except by the test of time, far less of what is best to be done for him, so that the dentist has ample opportunity for the exercise of all his discretion in knowing when to give way to his patient, and when to fight out his little battle in the patient's own interest. And it is very desirable that he should cultivate a thoroughly kind and tender feeling towards those who honour him with their confidence—I say cultivate, because I believe that such a habit of mind is strengthened by use, and that it is just as easy to entertain a friendly feeling towards those to whom we are able to render service, as it lies deep down in imperfect human nature to dislike those whom we have in any way injured. He must have a good physique, his work is hour after hour exhausting in a degree that no one who has not tried it can appreciate. With busy practice comes another difficulty, and that is to avoid being hurried, and to keep for each patient time enough to do him justice. There is no temptation for the busy dentist to spend one moment more than is absolutely necessary over his work, on the contrary, there is a very strong temptation in the other direction, as it becomes very difficult to satisfy all those who wish to be seen, and who do not realise that dental operations take so long that it is rarely possible for the dentist as it may be for the medical man, to squeeze in another patient when his appointment book is full. So that a good deal of moral firmness is needed every day to keep the dentist out of this pitfall. And he has all the more need of these qualities in that his patient can never know the extent of the difficulties of his work—difficulties that are great enough though the work be small—and will often be inclined to rate as high, or higher, the practitioner who attempts nothing difficult, but pilots their teeth towards a gradual and painless euthanasia, as he who renders far more real service, but in attempting much more now and again fails in something that the other would never have attempted.

It may be said that these qualities which I have sketched would have led to success in any calling ; so I believe they would, and I fancy it is generally true that the man who scores a real success in any calling would have done so in a good many others had his career been a different one.

One more word before I leave this matter of professional success. By success I do not mean merely pecuniary success. I do not call it real success unless a man stands in the opinion of his own professional brethren at least as high, or higher than he does with the public. It is, unfortunately, the case that in all branches of the medical profession, and very especially in ours, the ear of the public is sometimes to be caught by self-assertion, and the many hydra-headed forms of quackery. It is sometimes asked why, when the manufacturer or the dealer advertises his goods without exciting the smallest adverse comment, should it be considered disgraceful for a barrister, a stock-broker, or a medical man to advertise himself. The difference is not far to seek, though it is often overlooked. The one advertises an article which he wishes to make known to the public, and it is greatly to their convenience that he should do so; the one extols a thing, the other extols a man—himself. And there is this further difference—the thing may be new, all that is said about it may be true. but this can hardly be the case with the personal advertisement. For all knowledge that is of importance in a professional sense is very soon public property, for each to make use of as his abilities serve; but it would hardly have the effect he desires were the advertiser to say "I am even as other men are;" he must brag in some form or it would be no good, and when he brags he can hardly be truthful.

Let us turn from this disagreeable subject to a consideration of the reaction upon the man himself of success in practice. Wealth he can hardly attain—the limits of time preclude it; and the great income of a surgeon or physician in the front rank is impossible. But ease and comfort and moderate savings are within the reach of a large number. He will have but little leisure; the large expenditure of time upon his operations in order to do them properly not merely sets a limit upon the amount that he can do, but the number of hours during which a man can do such work without undue exhaustion being soon reached, he has none too much energy for other things. One day's work very closely resembles the next, and the next, and though I would not be understood to say that there is not more of variety, and more scope for the exercise of sound judgment than any outsider might suppose, nevertheless, it is all exercised upon a strictly limited class of subjects, and so has its special mental dangers. The dentist in large practice may be compared to a man who daily journeys along a deep lane, shut in with hedgerows on either side. In such a lane there will be much for him who has eyes to see it, more perhaps, than in a lifetime he can possibly exhaust, if he observes its geology, its fauna and flora, and the phenomena of human life and its ways that unfold themselves there ; but for all that, our wayfarer will never understand even his little world if he never looks outside it. I came across a passage in one of Stevenson's novels the other day which illustrates what I mean :—"The dull man is made, not by the nature, but by the degree of his immersion in a single business. And all the more if that be sedentary, uneventful, and ingloriously safe. More than one-half of him will then remain unexercised and undeveloped ; the rest will be distended and deformed by over-nutrition, over-cerebration and the heat of rooms." And, inasmuch as it is easy to see the mote in our brother's eye, I often fancy that I can trace the narrowing and cramping effect of our necessarily limited horizons, which prevents our even seeing what is really well within their limits. There are countless problems lying before us ; the etiology of the diseases we have to treat, problems of heredity laid out before us—a rich and varied field for observation, yet how many cultivate it, even making due allowance for the fatigues of our routine work. By all means then, let the dentist who would keep his mind fresh cultivate a hobby. A hobby is more restful than idleness and is a joy for ever, if it be well chosen. I recollect being struck with the sadness of the end of the life of one of the greatest physicians of recent days, who had no hobbies. He broke down in health, so that he could not practise, and then time hung heavy, even on the hands of a bright intellect, because with failing health and declining years, it was too late to take up a fresh pursuit. And as a contrast, the end of the life of a great surgeon, who, when he retired from practice, eagerly turned to the pursuit of art, which he had cultivated with a great measure of success throughout a long and busy life. And I think I can trace the same cramping effect in our relations to outside matters. Important to the well-being of the individual are his teeth ; yet man is not wholly a complex organism constructed for the purpose of carrying about thirty-two (or fewer) teeth. Useful as I hope we are, we are only a small section of a great community, and while we hope that any legislation which we may be able at any future time to influence, will be upon the lines on which we have sought to improve the position of our profession, we must always remember that it is only because the advancement of our profession is, broadly speaking, for the public weal, that what has been effected in the past was possible, and that which may be effected in the future can come into the sphere of possibility only upon the same grounds of a general public utility.

THE RELATIVE MERITS OF FILLING MATERIALS.

By Edwin T. Darby, M.D., D.D.S., Philadelphia.

The makers of modern alloys, almost without exception, claim three distinct points of excellence. First, they will not shrink in hardening; second, they will not expand; third, they will not discolour. As proof of the first two, they submit the test experiment of Fletcher, which is the glass tube and the aniline blue, the polished hole in the bar of steel, as suggested by Tomes, and the V-shaped steel trough of Hitchcock. For the third claim, they have no experiment but that of use in the mouth.

It is true that most alloys composed of silver, tin, gold, and platinum or zinc do not show indications of either contraction or expansion when the experiments are made out of the mouth; but how often we see amalgam fillings in the mouth that have the appearance of having been pushed slightly out of the cavity. Especially is this true of large compound fillings.

Again, how frequently we see this same class of fillings which have the appearance of having contracted, leaving a slight space between the metal and the walls of the tooth. A little of the same mixing put into the glass tube and covered with aniline blue would probably show no similar change.

Again, the same alloy, manipulated in the same way, does not always present the same appearance in the mouth. In one instance it produces a perfect filling, and we are pleased with it; in another instance, where the conditions are apparently the same, it produces an imperfect filling, and we are displeased with it. It is just this variability in the results obtained with any or all of these alloys that at times causes discouragement and chagrin. We have all doubtless seen alloy fillings of our own, or from the hands of others, which have fulfilled in the highest degree the desirable qualities to be sought for in a filling material ; and we have also seen in the mouths of our patients, or in the mouths of other men's patients, results which make us blush at our own, and pity the lack of skill shown by our brother.

It is this lack of uniformity as to the result that leads us so often to say that the more we see of amalgam the better we like gold.

Were all cavities to be filled situated upon masticating surfaces, and surrounded by strong walls, and prepared with the same care that is usually bestowed upon cavities for gold, and then filled with almost any of the better class of alloys in the market at the present time, and, after hardening, smoothed and polished as gold fillings are, there would be little doubt about the saving quality of amalgam.

A combination of gold and amalgam in the same cavity, or brought in contact in the same tooth, is often attended with the most pleasing results. Thirty years ago such a combination would have been thought bad practice ; but we have learned some wisdom in thirty years, and, among other things, we have learned that if we do the opposite from what we were then taught we obtain the best results. We have all observed, doubtless, that where a large amalgam filling has been placed upon an approximal surface and allowed to come in contact with a gold filling upon the masticating surface, the amalgam has turned quite black, but the margins have been clean cut, with none of that bulging from the walls of the cavity to which I have alluded.

Some years ago Dr. Register, of Philadelphia, suggested the idea of filling large cavities on approximal surfaces two-thirds full of amalgam and while the material was yet soft working into it gold foil, and completing the last third of the filling with gold. In places where a matrix can be used, and the amalgam confined, excellent fillings can be made. Watt's crystal gold, or the crystal mat gold, can be used for this purpose, as it absorbs the mercury more readily than foil. Of course, discolouration of the alloy must be expected ; but in hidden places or in posterior cavities this is not a serious objection to its use.

Copper amalgam is both good and bad. It is good just in proportion as it turns black and remains so; it is bad just in proportion as it assumes that steel-gray colour and retains it. The only proper places for it are masticating buccal and lingual surfaces of vital teeth; in such places it has often done good service for a number of years. By combining about one-fourth part of a good gold and platinum alloy with it, better results are obtained. Palladium amalgam makes a filling of superior quality; but it sets with such great rapidity that there is little comfort derived from its use, and it has the objection of intense blackness, resembling charcoal or ebony.

The non-metallic plastic filling materials which are worthy of our consideration are but three in number,—gutta-percha, oxychloride of zinc, and the oxyphosphates.

When, in 1849, Dr. Hill introduced the stopping which bears his name, great hopes were entertained that it would take the place of gold; but it was soon found that it did not make a permanent filling. Soon after its introduction it was followed by the Bevens stopping, which was superior to anything that had preceded it, and, in my opinion, greatly superior to anything that has ever been known since that day. The formula was never divulged, and the inventor died a few years after he had introduced it. This material possessed qualities never seen in any other preparation in which gutta-percha formed a part. It became exceedingly hard after it had been in the mouth a short time; and when an attempt was made to remove it, it was found to resemble horn, or rubber that had been vulcanized. Most of the preparations of gutta-percha offered for sale contain oxide of zinc, lime, silex, or feldspar, and are quite variable in their lasting quality. They are best adapted to buccal surfaces, and will preserve the teeth if watched with care and renewed when worn away. They cannot be numbered among the so-called permanent fillings.

The oxychlorides were introduced in 1856, by Sorel, of Paris, and were first used for stucco work. As a filling material for teeth the preparation did not fulfil the high claims which were made for it; but it occupies a worthy place in dental practice. The author looks upon it as the most valuable material for capping exposed pulps, and as the best filling for root canals. It possesses an antiseptic quality, the value of which is often overlooked when choosing a material for the canals of teeth. The difficulties which some experience in introducing it into the canals of superior teeth would be largely overcome if a shred of cotton or floss silk were used upon the broach.

The combination of oxide of zinc and glacial phosphoric acid, and known under a score of names, is worthy of more than passing notice.

The Dental Cosmos.

MANAGEMENT OF CHILDREN IN DENTAL PRACTICE.

By Meta Tudor Haley, D.D.S., West Chester, Pa.

To deal with children in any capacity, we must direct our efforts from a psychological standpoint, and it seems to the writer that in no other capacity do we need to have a clearer conception of the nature of mind, a better knowledge of its development, and the related tendencies of its faculties. While we may not say that the child has been taught to fear a dental operation, we may safely assume that all he has ever heard on the subject at home or abroad has tended in that direction. To relieve the mind of this feeling, to eliminate fear and bring the mind to a realization of at least not more than the actual experience, is a difficult and not always a successful undertaking, but once accomplished it is a principal element in success with children.

The question arises, "How shall we proceed?" It is plain that the *modus operandi* must necessarily differ greatly, for though at all times we fight the same enemy, we attack him in a different stronghold each time, with a varying strength of forces and intrenchments. Then, too, each one of us must work along the line marked out by her own individuality. All, however, must start from the same basis,—a knowledge of the emotion of fear and a close study of its causes,relations, and effects.

The fear of physical pain is innate, and finds its expression in a manner corresponding to the temperamental tendencies of the individual. Pain from some actual infliction may be severe, but mere pain is not fear. It is only when the mind anticipates some painful infliction, still in the future, that we are liable to the emotion of fear. We must regard pain in two aspects, a mental and a physical. On the mental side we are to bear in mind the volitional element, or stimulus to the will; on the physical side we must consider the associates of pain, the causes and collaterals that engage the attention during the period of irritated sensibility. These last are the distinguishing characteristics, and by them the pain may be afterward recalled. The revival of pain in idea is purely mental, and the conditions that favour this revival and subsistence increase the feeling of fear. In a fully and harmoniously developed mind, where the intellect, the feeling, and the will are ideally balanced, the revived idea should exactly coincide with the actual experience. But this condition is seldom or never found in the adult mind. We do sometimes find the feeling so under the control of reason and will that the expression of fear, and indeed the fear itself, may practically disappear.

In the undeveloped mind of the child we cannot expect to find either of these conditions in any degree approximated. He is all senses, and the impressions received through the senses are modified largely by that mental faculty which predominates in each individual case. This predominance rests upon a basis of temperament, inheritance, and training. Once arrayed on the side of the operator, it becomes his most powerful ally. To recognise the trait, and use it somewhat as a key to the situation, presupposes a knowledge of psychological relations, and requires a quickness of perception, a nicety of judgment, gained only by a constant alertness and perseverance. This is a work in itself to the operator, and with many who view it superficially a "game scarcely worth the candle," presenting no visible compensation. But it is a work that cannot fail to broaden us, benefiting ourselves individually as well as professionally.

If we could get the child at a period when the first experience would be attended by a minimum amount of pain, the work would be comparatively easy. Where he has heard nothing of the terrors of dental work, the mere concentration of the attention may result very happily. If his mind is already a storehouse of the expressions of his grown-up friends, the situation still presents only a mental side, with the judgment in the balance and odds against us. In older children of a peculiarly sensitive organization, this last condition is one of the most difficult with which we have to deal. Having had no experience in this direction, their fear is of a new kind of pain. The excited imagination may conceive boundless misery. It shifts from one conception to another, rendering impossible the exercise of fortitude, accommodation, or resistance.

When the child has already had a painful first experience, and has sat with senses alert and nerves and muscles braced, a condition in which any sensation is magnified, we have a situation of more serious complexity. The imagination is our chief foe, but it may also become our chief friend. Though the reason is developed quite early in some children, it cannot be relied upon to any extent in this matter, and the will as a controlling factor will depend largely upon the training. The element of will may be used to advantage in the limitation of the period of restraint, making it in a manner a matter of choice to the child. This has been found an excellent device in overcoming the natural restlessness of childhood. A challenge to physical endurance may also work well with older children, if we are careful not to go beyond the prescribed limit.

A most important factor in the work is the feeling and attitude of the operator toward the patient. A child is a severe critic. His confidence is easily won, but it is as easily dissipated by any act of insincerity or lack of sympathy. Unfortunately, the parents themselves sometimes advise or request deception on the part of the operator, and while such must be treated with due deference, they should not influence to the point of yielding. Aside from the principle involved, yielding may turn not only the child but the parent from you.

Most especially must the operator be able at all times to recognise the limit of courage, and not go beyond it; for once beyond, the child is entirely undone. He has lost confidence not only in the operator, but in himself. Patience is also one great need of the operator, and, unlike forbearance in the old proverb, seldom ceases to be a virtue. Sympathy judiciously expressed is a grateful panacea in distress, and an efficient spur in a struggle for victory.

Embracing all these, and hiding still in its unpretending brevity, a something without which all our efforts are apt to fall short of success, is tact. It renders available the knowledge gained through investigation and experience, adjusting the underlying plan to the opportunity. This underlying plan or principle, this driving-wheel which may set the whole train of mental machinery in related motion, is the force of positive suggestion. Designate it by what term you may, it is a wonderfully subtle power to which few minds are wholly unsusceptible. The delicately poised faculties of the child are easily swayed by its influences. Much has been said, and undoubtedly much remains to be said, on this subject. The one who discusses it from too material a basis is criticised in turn with him who advances it to spiritual infinities. It is a factor to be recognised in all dealings with individuals, a subject to be studied, though in this study we must remember that we are working with the very fabric we are trying to analyze or investigate,—an influence to be used cautiously, carefully, and intelligently.

The Dental Cosmos.

PULPITIS CHRONICA IDIOPATHICA.

By P. Macarovici, M.D., Roumania.

The dentine-fibres or fibres of Tomes are normally, so long as they are secluded from contact with the atmosphere, in the author's opinion,nothing else than lymph which is derived from the pulp, traverses the dentine canals, and also penetrates into enamel; they serve for the nutrition of the dentine and enamel, and partially also for that of the cement, where they may be regarded as auxiliaries of the alveolar periosteum. This fluid has the property of becoming solid on contact with the air, being fluid only while in transit from the pulp to the enamel through the canal of the dentine. At the instant of contact with the atmosphere the fibres of Tomes solidify at their superficial extremity, forming an elastic membrane provided with minute pores, which allows of the transudation of a small portion of the still fluid lymph, and which in cases of fracture of the tooth serves for the formation of the callus. If the solidification proceeds until finally the pores are obliterated, such solidification involves the entire extent of the fibres from their peripheral termination to their origin in the pulp.

It is his firm opinion, and it is shared by several authors, that the inner wall of dentine looking toward the pulp and surrounding the same, continues to grow after development of teeth is complete, and that hence hyperæmia brought on by intense emotion, violent movements, and other causes, may from the mineral substances contained in the blood bring about a hypertrophy of the dentine which causes a narrowing of the canals of the dentine at their mouths in the walls of the pulp-chamber, and thus interferes with the entrance and circulation of the lymph (fibres of Tomes). The mineral substances are thus retained in the pulp, where they undergo evolution into dentine, cement and enamel, which are intermingled, or else unite in groups of one or several homologous cells. This process has been verified by the observations of several authors, who state that they have found enamel, dentine and cement in the new formation.

Notwithstanding the fact that lymphatic vessels have not yet been shown to exist in the pulp, it is nevertheless certain that lymph must be present in the pulp. This theory of the fluid nature of the fibres of Tomes is substantiated by the formation of callus after fracture of the teeth. From whence comes this callus if not from the secretion of plastic lymph? And if the fractured portions of the crown contained no fluid in themselves, how could the lymph which is supposed to come from the pulp unite the fragments, which would in this case be toward one another as foreign bodies?

This theory also explains the great sensibility which exists on touching with a pointed probe a point in the line of junction between the dentine and the enamel, whereas the sensibility is much less at any point of the dentine itself. The hyperæmia which may be the cause of an inflammation of the pulp, determines the place of the dentine-formation. If, for instance, the inflammation is intense, the entire pulp is implicated, and the concretions come to be free in the chambers, and are of different size and form. If the inflammation is less intense, it becomes limited to certain parts of the pulp, only the apex or the lateral walls. In these cases the mouths of the canaliculi only are narrowed which correspond to the site of the inflammation, and the newly-formed dentine is deposited in that spot and forms a mass in connection with the fibres of Tomes as well as with the dentine canals. This is the origin of Salter's secondary dentine.

Such secondary dentine is also found at times in caries of the teeth.

The Dental Cosmos.

SULPHURIC ACID FOR OPENING ROOT-CANALS.

By J. R. Callahan, D.D.S., Cincinnati, O.

It is seldom that we see canals in buccal roots of superior molars, or in roots of lower molars, in which a drill can be used ; many times in bicuspids and inferior incisors the roots are so flat and thin that drilling is dangerous ; yet all these canals may be in such condition that we are compelled to open them for treatment and filling. There are canals that are restricted just at the chamber, sometimes so much so that they can scarcely be found, yet the canal in the root is large and should be opened. There are the canals in curved roots, and canals obstructed by osseous growths, that if not properly opened would most likely cause trouble. It is with this difficult class of root-canals that I wish to deal at this time.

It is about four years since I began to open this difficult class of canals by using a 20 to 50 per cent. aqueous solution of sulphuric acid and the Donaldson Root-Canal Cleanser. To illustrate the method, let us suppose we have a superior molar tooth, from which the pulp tissue has been removed, the palatine root being large, can be prepared by any method you may choose ; but let us say, the canals in the buccal roots cannot be found, we would then place a pledget of cotton, saturated with the acid solution in that portion of the cavity near the buccal roots and seal it in the tooth for twenty-four or forty-eight hours ; then upon removal of the stopping, wash out the cavity with a dash of water from the syringe, upon drying the cavity you will find it white and clean, with two dark spots in the vicinity of the buccal roots, showing where the canals can be found.

Now we try to enter the canal with the nerve bristle, we find no opening ; to make sure we are not being deceived by a constriction, we take a bud drill and follow these stains a short distance. If we find no opening or a very minute opening too small for the bristle, we will feel justified in saying they need no further treatment. But, if with an exploring instrument a canal is found, we will carry the acid to the canal by dipping the instrument in the solution, or by means of the pliers, or better still with the latest pattern of the Dunn Syringe place a drop of the agent in the chamber, (the Dunn Syringe referred to is made of glass and rubber with a platinum or gold point), and with a No. 5 Donaldson Canal Cleanser pump the acid into the canal ; the acid will soften the walls of the canal sufficient to allow the broach to open its way into the root; the acid will also thoroughly sterilize the canal and everything in it. No germ or spore can live in the presence of H_2SO_4 in the strength mentioned. The broach may scarcely enter the canal at first, but if you are persistent it will be but a few minutes till the instrument will go quite a distance into the canal until you reach the end of the root, where a much stronger resistance will be met with. The thickened cementum at this point, seems to offer a greater resistance to the agents used. The canal can then be enlarged by using larger broaches, or if the root-canal is straight the Gates Glidden Drill will follow the canal just made. It is more than likely that the apical foramen has not yet been opened; this can be accomplished, if desired, by drilling or by placing a small thread of cotton saturated with the acid solution in the end of the root and leaving it there over night, then using the broach and acid at the next sitting; after one or two trials you can readily see how crooked or obstructed canals may be opened in a few minutes, and the canal will be in condition for immediate root filling. It must be borne in mind that the rubber dam should always be in place before the operation is begun; the adjoining teeth may be protected by placing the dam only on the tooth being operated on.

I confess that at first sight, the application of so strong a solution as 50 per cent. looks to be rather heroic; good results may be obtained by the use of weaker solutions, but four years constant use has proved that there is little or no danger of injuring the tooth or the surrounding tissue, if the operation be controlled by common sense. We do not hesitate to use arsenic, or nux vomica, aconite, argenti nitras, cocaine, and scores of other poisonous drugs. We can have the action of the acid under perfect control. I always keep a saturated solution of bicarbonate of soda on the case so that I may stop the action of the acid at any moment. In but few cases is it probable that the acid will go through the apical foramen in quantities or strength sufficient to have any corrosive effect, for the reason that neutralizing agents in the dentine will have materially weakened the acid before it can pass through the extremely small opening at the apex of the root; if there be an abscess present the foramen is likely to be larger and the condition of the tissues about the apex of the root will be materially benefited by the presence of the acid even if in the full strength of the solution. In my mind there could be no better agent for the breaking down of the diseased tissues and the positive destruction of all germ life.

The acid at first attacks the tooth substance vigorously, breaking up the lime salts, and corroding or changing the form of the organic substance and forming a new compound, thereby establishing a barrier to the further progress of the acid.

Prof. J. S. Cassidy, in his valuable text-book, "Dental Chemistry and Materia Medica" (page 77), says: "The acid attacks the earthy portion forming insoluble calcium sulphate, $(CaSO4)$, and at the same time dehydrating the animal or gelatinous portion, which is mainly made up of carbon, hydrogen and oxygen; these two latter elements are withdrawn as already alluded to, leaving the indestructible carbon as a residue, to be incorporated with the insoluble sulphate, producing thus, a protecting covering to the unaffected parts beneath, against further inroads both of the causing agent and other solvents."

As to the action of the acid solution on the bone surrounding the roots of the teeth, I quote Mr. George Pollock, F.R.C.S. Surgeon to St. George's Hospital, who says: "Dilute sulphuric acid does not affect the living bone, acting chemically on diseased bone alone." and gives the following experiments: "Portions of dead, diseased, and healthy bone were selected and subjected to the action of sulphuric acid, viz.:

No	1.	Dead bone,	10	grains.
,,	2.	Diseased bone,	,,	,,
,,	3.	Healthy bone (middle age),	,,	,,
,,	4.	Healthy bone (old age),	,,	,,

"Exposed to the action of a mixture of sulphuric acid and water, one part in four, for three days, at a temperature of 100 degrees, the following were the results:

"No 1. Dead bone: Phosphate of lime 2 grs. Carbonate of lime 3.30 grs. dissolved in the mixture.

"No. 2. Diseased bone: Phosphate of lime 2 grs. Carbonate of lime 1.3 grs. dissolved in the mixture.

"Nos. 3 and 4. In both specimens of healthy bone. *No action took place.*"

Prof. Garretson says, in the treatment of "Caries of the Maxillæ," he has used the "officinal ordinary sulphuric acid." (Garretson's Oral Surgery, Third Edition, pages 705 and 706.)

On the soft tissues the solution will have a corrosive and astringent effect, or in other words will break down or destroy the diseased tissue, leaving a fresh, clear field for nature to take care of herself, with the assistance of milder antiseptic treatment.

The Dental Register.

HAND WORK *V.* MACHINE WORK FOR DENTAL OPERATIONS.

By Edmund Noyes, D.D.S., Chicago, Ill.

The most striking characteristics of machine work, especially that of automatic machines, in which the action is not guided in detail by the hand, are uniformity and accuracy, the closeness of which is only limited by the perfection of the machines. The productions of machines of this class are strikingly different from the products of natural growth or development, in the circumstance that the products of the machines are duplicates of each other, and in assembling the parts of the manufactured articles any one of a thousand like pieces will fit equally well with its fellows, and the thousand completed articles will scarcely have any appreciable differences ; while nature never makes a thousand things exactly alike, and scarcely even makes two alike.

In another class of machines (and in this class the dental engine belongs), the actions of the tools are directed in detail by the hand, the object of the machine being to furnish greater power, or more rapid motion, or a different kind of motion than what the hand could give to the tools without the aid of the machine ; or it may be to simply relieve the operator of the machine from part of the muscular exertion that would otherwise be necessary. There are only two important methods of applying machine force for the uses of dentistry in operations upon the teeth ; one by means of some sort of revolving instrument, and the other some contrivance for striking blows ; the latter being used only for packing filling materials. The most important limitations of the application of the dental engine are therefore found, because of the fact that much of the work upon the teeth can be done better by some other means than a revolving tool. In a general way it may be said that hand work is better for the removal of decayed or softened material from carious cavities, and the engine tool is better for cutting sound dentine or enamel, except when enamel is undermined by caries or there is a notch reaching to the dentine, in which cases enamel-cutting can almost always be better done with hand instruments, either by splitting off in lines of cleavage or by paring along the exposed margin. Fissures in grinding surfaces of molars and bicuspids, if but little decayed, can usually be cut more rapidly and satisfactorily with the engine; but if decayed to such extent that overhanging enamel can be broken in with a chisel, that is a better way. The extension of proximate cavities into sound dentine and enamel toward buccal and lingual angles can be done much quicker and often more accurately with the engine bur if the places are reasonably accessible. This is especially the case if the cavities are cut, as is usual, from the grinding surfaces. Small proximate cavities may often be opened and enlarged with the engine, suitable access and opportunity being the determining factors. A hand instrument, even a straight drill or bur, can be used more carefully and accurately in a place difficult of access, or through a narrow space, than can a similar instrument in the engine. When we get a good, adjustable hand-piece, as seems likely to be the case before very long, we can use the engine instruments in a few places not satisfactorily accessible to them now. A right-angle attachment will do some things that a straight instrument will not, but the manner of access to the teeth and the necessary lines of direction are such as to make a tool set at an obtuse angle, perhaps about 45 degrees, more generally appropriate than either a straight or right-angled one.

The engine is a very valuable helper for the opening of pulp-chambers through fillings or through sound enamel and dentine, sometimes also for removing the "roof" or cover from a pulp-chamber by cutting away the floor or bottom of the cavity of decay; but care and watchfulness are necessary in all work with the engine in pulp chambers, for we very often see the results of accidents or mistakes in such work: for instance, the pulps of molar teeth in middle life or old age are sometimes very small and the distance through the chamber very short, so that unless closely watched the drill may enter the chamber and pass through it so readily as to begin cutting upon its floor unperceived by the operator, till he has entered the alveolus in the bifurcation of the roots. Engine instruments should not be used in the root-canals of teeth. The exceptions to that rule are few and mostly relate to front teeth whose crowns have been broken off, so as to give direct access to the canals with a straight instrument. Even in such cases, there is seldom any need of using it.

It may be stated in a general way that the engine is useful and appropriate for the cutting away of fillings, for penetrating a filling or tooth, and for the cutting of sound dentine and enamel whenever that is required and the work is accessible to the engine instruments. Hand instruments are more satisfactory and appropriate for removing overhanging enamel, for the removal of decayed dentine, and usually for the final trimming and shaping of cavities and their margins, and the making of undercuts or retaining grooves.

The engine is an exceedingly useful and important helper in the finishing of fillings, but here, no less than in other work, discrimination is necessary, and we often see instances in which work might have been much better if more hand work had been done. For grinding surfaces, of course nothing is so appropriate as a revolving bur or stone in the engine, but upon proximate surfaces, unless the adjacent tooth is missing, the engine discs should usually be restricted to the buccal and lingual margins and the grinding surface angle. A laborious half-hour's work of packing gold enough to fully restore the bell-shaped crown of a bicuspid or molar may easily be destroyed in a moment or two by an attempt to do all the finishing with engine instruments. The rough trimming of the cervical portion should be done with files or cutting trimmers, and the other borders with the same, or with engine instruments, as most convenient ; and after most of the surplus has been removed, there is nothing that will accomplish so satisfactory results in most instances as the flexible narrow corundum tapes. These are the places for an artistic perception of the form required and patient care to realize your ideal. Hand work is capable of versatility, adaptability and individuality in much higher degree than machine work, and where these are important, as in the nice shades of difference in the forms and contours of tooth-restorations, the engine should be used sparingly and carefully, and much work done by hand, even though the time required be longer.

Students should not be given the engine too soon, but should acquire strength and skill of hand and facility in performing most operations with hand instruments. This is especially the case in regard to the dummy work of the first year in the technic laboratories. The object in view is to get the widest range of skill and experience and the fullest mastery of all our resources, and if hand work is learned first, the student soon becomes master of both hand and engine instrumentation, while if he learns the engine work first, he is pretty sure never to learn how to do anything by hand that he can possibly do with the engine.

Dental Review.

A NEW PRACTICAL METHOD OF FUSING PLATINUM.

By L. E. Custer, B.S., D.D.S., Dayton, O.

The production of heat by electricity depends upon two factors, the quantity of electricity and the resistance of the conducting agent. As the quantity is increased the heating power is increased, but this power is not apparent until the current meets with some resistance. The unobstructed flow of any quantity of the fluid does not produce heat. It is only when there is placed in the circuit a poor conductor of electricity that we have this manifestation. All metals are comparatively good conductors of electricity, yet these vary in their conducting power. Copper stands at one extreme and German silver at the other. In the electric gold annealer, platinum wire is used because it is a poor conductor and does not oxidize. The size of the wire is another factor in the determination of heat. With a given length of wire the resistance increases as the diameter of the wire decreases. That is, a small wire has less carrying capacity than a large one, so that when the same amount of current that is easily conducted by the large one, is forced through a small wire, the condensation produces heat. So with the same quantity of electricity at a given pressure, heat is produced according to the resistance of the conducting agent.

The atmosphere is practically a non-conductor of electricity, yet under certain circumstances it does allow the passage of an electric current. When a current has been established by bringing two terminals together, the electricity continues to flow, even after the ends have been separated. It leaps the intervening thickness of air in the form of the voltaic arc and continues until the distance becomes too great. This action develops so much heat that it has led to the supposition that electricity is another form of heat. When the oppositely electrical clouds unite, it passes through the atmosphere as lightning, when the leyden jar discharges, it is the spark, or when it lights the street corner, it is the arc. The heat of the arc is so intense that by our present knowledge it cannot be measured. By the ordinary incandescent current, we can not only melt platinum and iridium but in small quantities we can vaporize them.

Upon the foregoing he has devised a special method for making and using the voltaic arc for melting metals of a high fusing point. While it is equally applicable to the "arc current" so called, and 500 and 220 volt currents, he uses the appliance as adapted to the 110 volt current, that which is used for incandescent lighting and which is the ideal current for dental purposes. Since a large quantity of current is necessary, the safety plugs should be as large as No 16 or 18, English standard gauge. A resistance coil of four pounds of of No. 18 copper wire will prevent fusing the plug and at the same time give a large arc. This is placed at a convenient point in the circuit. It becomes heated so should be insulated and ventilated on asbestos if it is to be used any length of time.

A block of carbon, such as is used in batteries, is connected with one wire for the receptacle, and a carbon pencil is attached to the other wire. Carbon is used for the receptacle because it is a conductor of electricity, a poor conductor of heat, is non-combustible, and can easily be fashioned to mould the melted metal. An improved bed is composed of ordinary stove blacking and powdered asbestos, equal parts, and thoroughly mixed and united. This is a poor conductor of electricity and is itself heated by the current. It is also a better non-conductor of heat, which is of importance where large quantities are to be melted. A piece of charcoal being a conductor of electricity and a poor conductor of heat, also makes an excellent receptacle. This part of the appliance should be mounted on an asbestos base, or if small quantities are to be fused it may be held in the left hand by a suitable handle. In the right hand the carbon pencil is to be used. This is made of an electric light carbon five or six inches long. A hole is drilled two-thirds its length, and in this hole is inserted the other terminal wire. This wire is so insulated that only the end comes in contact with the carbon. By this arrangement the upper two-thirds of the pencil, although charged electrically, does not become heated and answers for a handle. With the incandescent current there is no danger to life.

The operation is very simple. The platinum is laid on the carbon bed and the pencil is brought in contact with it. Immediately there is a current established from the pencil through the platinum to the carbon bed or *vice versa.* Upon raising the pencil a short distance an arc is formed directly upon the metal and it is melted The arc can be carried about at will until the pieces are all brought into one mass.

With the above arrangement from five to eight dwts. may be melted at once, but there is no limit to the amount that can be got together in one mass by a process of fusing. It is possible to so manipulate the arc that only part of the mass will be melted and to this more metal added.

Dental Register.

STERILISING DRINKING WATER.

Mr. Frank Watts, F.I.C., analyst to the Government of the Leeward Islands, communicates the interesting observation to the *Chemical News* that the addition of ferric chloride to hard water containing micro-organisms has the result of precipitating the organisms along with the ferric hydroxide. At all events, the supernatant water is found to be sterile. In the case of a soft water—*i.e.*, one in which no precipitate is produced on the addition of ferric chloride—after the ferric chloride is added, a small quantity of lime-water, or of dilute solution of carbonate of soda is thrown in, and this causes a precipitate to form. It is found that vigorous stirring promotes the granulation and subsidence of the precipitate. The precipitate is allowed to subside, and the clear water is drawn off for use. It is found that 1 to 1½ fl oz. of strong solution of perchloride of iron (B.P. strength) are sufficient to purify 100 gallons of water. For domestic use it is advisable to dilute the solution considerably —say, ten times—and to use a teaspoonful of the diluted solution for each gallon of water. If a sufficient quantity of water for one day's use be treated at night, a supply of pure water will then be ready for use every morning.

ULCERS OF THE MOUTH IN TABES.

Louis Wickham describes a characteristic form of buccal ulceration which supervenes in some cases of tabes. The ulcers are so clean in appearance that they ought at once to suggest the nature of the primary disease. They are seated, wholly or in part, on the alveolar processess. They encroach upon these at some points, though they may extend to neighbouring mucous surfaces. They are indolent and anæsthetic. The probe will often reveal an orifice which leads down to a bare surface of bone. Evolution may be slow or rapid. The teeth are absent in part or altogether; they have fallen out painlessly. There may be deformities of the jaws. The history of the case will give important information; it will show how the deformities, &c., originated. There has probably been an abscess, necrosis of bone, and elimination of sequestra. The teeth fell out before ulceration began, and all the lesions evolved in a "noiseless" fashion. These circumstances enable one to put aside tuberculosis, syphilis, phosphorus necrosis, and severe mercurial stomatitis.

The actual nature of such lesions is still uncertain. They may be due to trophic disturbances directly dependent upon tabes, or they may be due to dento-alveolar periostitis, which, in a tabetic subject, takes on an aggravated form.

La France Medicale, 26th January, 1894.

Dental News.

THE EDINBURGH DENTAL STUDENTS' SOCIETY.

The tenth Annual Dinner of the Edinburgh Dental Students' Society was held in the large saloon of the Imperial Hotel, on the evening of March 8th, when over seventy gentlemen were present. Dr. William Craig, the Hon. President for the coming session, occupied the chair, while Mr. Sewell Simmons, L.D.S., the President-elect, and Dr.

Fred J. Turnbull, L.D.S., the retiring President, acted as croupiers. On the right of the chairman were Mr. W. Bowman Macleod, Mr. Dall, L.D.S. Glasgow, Mr. Ivison Macadam, F.R.S.E., Mr. Stewart Durward, L.D.S., Dr. Noel-Paton, Dr. Affleck, and Dr. Miles ; and on the left were Mr. Andrew Wilson, L.D.S., Mr Biggs, L.D.S., Glasgow, Dr. Matheson-Cullen, Mr. G. W. Watson, L.D.S., Dr. Farquharson, Dr. Basil-Orr, Dr. Macdonald Brown, and Mr. J. Dilks Page, L.D.S. South Shields. Letters of apology and good wishes were read from Dr. John Smith, Professor Johnson-Symington, of Belfast, the various Dental Students' Societies, many past students, and a pleasant telegram received from the lady dental student.

After an excellent dinner, and after the loyal and patriotic toasts had been duly honoured, the Chairman, who was enthusiastically received, proposed "The Edinburgh Dental Students' Society," which was replied to by Mr. Sewell Simmonds, L.D.S. Other toasts were "The Incorporated. Edinburgh Dental Hospital and School," proposed by Dr. Macdonald Brown, and responded to by the Dean and Mr. Andrew Wilson ; "The Edinburgh School of Medicine," proposed by Mr. S. G. Goldie, L.D.S., and replied to by Dr. Noel Paton and Dr. Miles ; "The Guests," proposed by Mr. Robert Lindsay, with replies by Mr. Dall, L.D.S., and Mr. W. G. Stevenson, A.R.S.A. ; and "the Chairman," by Mr. J. K. Mackintosh.

The toasts were pleasantly varied by an excellent programme of music provided principally by the students, headed by Mr. J. Douglas Logan, who has again proved himself an efficient accompanist and able soloist. Songs were rendered by Mr. David Munro, L.D.S., Mr. Goldie, L.D.S., Dr. Fred. Turnbull and Mr. Coleman, with instrumental selections by Messrs. Nash and Duncan (violin), and Mr. J. Morris Stewart (mandolin). The guests vied with each other in their efforts to entertain the company, and it would be invidious to single out any individual performance where all were excellent. Humorous recitations were given by Mr. W. G. Stevenson, A.R.S.A., Dr. Macdonald Brown, and Mr. Imrie, who gave an original experience of a visit to the Dental Hospital ; followed by banjo solos and songs by Messrs. Glen and Watt, and selections on the bagpipes by Pipe-Major Macdonald, the janitor of the Dental Hospital.

As usual one of the features of the evening was the artistic menu card that met the diners on their entrance to the saloon.

Drawn in black and white, and invented by one of the members of the Society, the general idea was a sarcasm on quackery, many of the pictures being somewhat veiled reproductions of local charlatanism with titles "Uneasy lies the the head that wears a crown;" "Answering the Surgery Bell(e);" "Suitable opening for a pupil;" "A stuffed canine giving pain;" "The missing Incisor;" "A case of covering;" and a series of pictures portraying an amusing dental incident entitled "An every day occurrence—long ago."

Altogether the evening was one of the most successful yet held by the Society, and will do much to bind the many friendships formed in student days.

EDINBURGH DENTAL HOSPITAL AND SCHOOL

At the second annual ordinary meeting of the Incorporated Edinburgh Dental Hospital and School, Mr. Bowman Macleod was in the chair.

The report of the Treasurer showed that special appeals made at the beginning of last year to enable the directors to purchase the property in Chambers Street, had resulted in 114 shares being taken in the concern, and in the giving of special contributions. Bailie MacDonald moved the adoption of the report. He pointed out that the treasurer would have to receive, in addition to the balance of £611, £1300 to enable them to fit up the new premises, and said he hoped that by next year the liberality of the public would have enabled them to pay off that sum. Dr. John Smith seconded the motion, which was adopted.

The report by the directors set forth that they had completed the purchase of the property in Chambers Street. The number of operations performed during the year ending 30th December, 1893, was 11,621. The number of students on the practising list was 37, as against 30 in 1892, and the directors believed there would be a further increase. The large increase in the number of operations and students demanded an increase in the operating staff, and four extra had been appointed, allowing three operators for each day. The special contributions amounted to £891 5s., including £400 by the Lord Provost, Magistrates, and Town Council from the residue grant, £210 from the Royal College of Surgeons, Edinburgh; £50 from Mr. W. M'Ewan, M.P., and others. The ordinary income was £693 17s., an increase of £176 9s. 3d., and the amount of funds in hand at the close of the year was £611 16s. 9d.

The chairman in moving the adoption of the report, expressed the hope that the public would enable the directors to meet the debt which they must incur in fitting up the new premises, the Society being the means not only of relieving pain, but of preserving the teeth of the public, and so helping them to keep in good health. This motion was also seconded and carried.

The other business was mostly formal.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
6. The Journal will be supplied direct from the office on PREPAYMENT of subscription as under:

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THE RELATION BETWEEN AFFECTIONS OF THE TEETH AND OF THE EYES.

By Dr. N. Feuer, (of Budapest).

Translated by Sydney Stephenson, M.B., Surgeon to the Ophthalmic School, Hanwell, W.

(*Continued from page* 393.)

A fistula of dental origin is occasionally met with in or about the lower margin of the orbit, and under such circumstances it becomes of great practical importance to distinguish it from fistulæ resulting from local periostitis or caries, or from disease of the lacrymal sac. We may devote some little time, therefore, to the differential diagnosis of these various conditions.

Given a fistula in the temporal half of the inferior orbital margin, the distinction must be made between a dental and a local origin. In the latter case, a probe, passed through the opening, will strike upon a hard rough base, which bars further progress. It is only when the carious spot is deeply seated in the orbit that the probe passes through the fistula and travels backwards for a variable distance ; the eyeball moreover, will probably be protruded in such a case. In dental fistula,on the other hand, the probe takes a downward direction, while the finger, stroking from below upwards, causes pus to exude from the fistulous aperture. Among other characteristics of orbital caries the following may be mentioned: it is of spontaneous origin, attacking for the most part weakly and scrofulous children. It generally lasts beyond the period of puberty, and often entails ectropion of the lower lid. Its favourite seat is the outer half of the lower margin of the orbit, (that is, the malar bone,) although two cases have been recorded in which caries attacked the upper margin of the orbit.

If, then, an adult, who manifests no signs of scrofula, of tubercle, or of obsolete syphilis, presents a fistula in the neighbourhood of the orbit, the possibility of a dental origin should be borne in mind.

Fistula proceeding from deeply-seated orbital mischief may be excluded, if (a) the eyeball possesses free movement, (b) the globe be not pushed forwards, and (c) when the probe strikes upon an obstacle in front, instead of passing backwards, into the soft tissues of the orbit.

It seems scarcely necessary to add that in making the differential diagnosis attention should be paid to the following points: (1) the history, (2) the presence or absence of swelling of the cheek, and (3) the results elicited by careful examination of the teeth.

An instance of dental fistula in the temporal half of the orbital ring has been recorded by C. Williams.[23] The facts were these. An alveolar abscess, which had arisen after extraction of an upper molar tooth, discharged itself on the lower margin of the orbit, under the outer commissure of the eyelid. The pus had burrowed under the zygomatic process and the temporal muscle, and was prevented from pointing in the temple not only by those structures, but also by the strong temporal fascia. It had then passed through the spheno-maxillary fissure into the outer and lower part of the orbit, to discharge by means of a fistulous opening in the position described. Distinctly marked exophthalmus of the left eye was present, along with serous chemosis of the conjunctiva. After the pus had been evacuated by means of an incision in the temporal region, improvement speedily set in (cited after Wedl).[24]

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[23] Williams. Dental Cosmos, 1887,

Caries, as stated before, attacks, generally speaking, the outer part of the orbital ring, whereas fistula of the lacrymal sac is seen towards the inner and lower orbital border. A fistula in the latter position, therefore, is due probably to lacrymal or to dental trouble, rather than to caries of the bone.

Sewill [25] records the case of a boy, ten years of age, who for several months had a constant discharge of matter from an opening near the inner canthus of the right eye, which aperture bore an outward resemblance to a lacrymal fistula. A probe, passed through the opening, however, reached downwards to a discoloured canine tooth, after extraction of which the fistula soon healed. Parinaud [26] records two cases, in children from five to six years of age, of fistula of the orbital margin, both of which were caused by carious teeth; he also describes two other cases, in adults, of fistula in the upper part of the lacrymal sac. As regards the former, it may be noted that inflammatory swelling of the cheek was absent. Further, after perforating the alveolus, the pus had not burrowed, as is usual, under the periosteum of the jawbone, nor had it passed along the maxillary sinus. It had in point of fact taken a path that may be explained by a reference to the development of the teeth.

At a certain period of development, the alveoli of the

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24. Wedl. Path. der Zähne, 1870, p. 169.

25. Sewill. Odontological Society of Great Britain, 1869 and 1883, Deutsche Monatschr fur Zahnheilk, 1884, p. 347.

26. Parinaud. Arch. gen de Med., Juin, 1880, and Deutsche Monats. fur Zahnheilk, 1884, p. 137.

permanent teeth are embedded in the anterior wall of the jawbone in such a way that their upper extremities reach the lower border of the orbital wall. These alveoli communicate with those of the milk teeth by an aperture, which, although narrow at first, later becomes wider, and is filled with nerves and vessels. Hence a large canal leads direct from the sockets of the milk teeth to the orbit. This is especially noticeable as regards the eye-tooth and the first molar. The further fact should be mentioned that communications often exist between individual alveoli. Pus, then, may reach the lower edge of the orbit by simply traversing this canal, and may thus lead to the formation of abscess, with or without necrosis of bone. Further, in one of the cases last mentioned a fistula and abscess in connection with a lateral incisor were established, without the intervention of a swelling of the gum or of the sinus referred to, for the pus in that instance followed a vascular channel, which, starting from the alveolus, especially of the canine teeth, runs upwards into the substance of the jaw, to end as a fine opening in front of the *sinus lacrimalis*. The canal sends out branches upwards and downwards, the former going to the orbital ring, the latter to the cavity of the nose, while inferiorly they proceed to the various alveoli. The existence of these canals may be readily demonstrated by the injection of fluid, and often by means of the probe.

Parinaud mentions another instance in which a dental simulated a lacrymal fistula (*La Revue Odontologique*, Mars, 1883; abstracted at length in the *Monatschrift für Zahnheilkunde* for 1884, page 137). A similar case has been observed by Jul. Scheff.[27]

The latter author describes in detail the differential diagnosis between dental and lacrymal fistulæ, and, with his assistance, we may contrast the leading symptoms of the two conditions.

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[27] Scheff. Pester Med. Chir. Presse, 1882.

In lacrymal fistula, following dacrocystitis, one finds:—

1. The fistula directly above the lacrymal sac, generally on the lower aspect of the internal palpebral ligament. The pus, however, may break through the wall of the sac, and insinuate itself beneath the skin along the margin of the orbit, but in that event it does not pass the middle line, while its path is marked by a livid swelling of the skin.

2. If the fistulous opening lie on the anterior aspect of the lacrymal sac, then a bulbous probe may be passed into a cavity, which, according to the presence or absence of dacrocystitis, may or may not give a soft feeling to the touch, due to the swollen mucous membrane; in caries of the lacrymal bone, it is possible to detect the presence of bare, rough bone beneath the sound. A fine probe introduced through the lower,—or better, the upper,—canaliculus, will strike against the bulbous sound previously passed into the lacrymal sac; if absolutely necessary for purposes of diagnosis, the upper lacrymal tube may be opened before a probe is introduced. In case the pus has burrowed some distance from the lacrymal sac, a probe introduced into the fistula will pass inwards and upwards towards the tear-bag, where it may be identified by means of the small probe passed through the upper canaliculus.

3. The secretion from a lacrymal fistula is not purulent, but glairy, like the white of raw egg, provided always that the dacrocystitis has been evacuated, and that there is no caries of the lacrymal bone.

4. Lastly, a fistula can be at once recognised as lacrymal when fluid, thrown into one of the canaliculi, emerges from it. Coloured liquid or boiled milk may be used for this purpose, and one need scarcely add that the other canaliculus should be compressed during the injection. Personally, I use a

hollow Bowman's probe, to the upper bulbous end of which a syringe is connected by means of india-rubber tubing.

A dental fistula, on the other hand, lies, according to Julius Scheff,(l.c.)not exactly on the lower margin of the orbit but about ½ cm. below it ; symptoms of disease of the tear-sac are absent ; the secretion is always purulent ; and an associated inflammatory swelling of the cheek is often observed.

Dental fistula, moreover, must be distinguished from (1) a local bone affection—which is, perhaps, seldom present, and (2) abscess of the antrum, that has undergone rupture. The diagnosis will be in favour of a dental origin if the probe passes downwards, an inference that will be decidedly strengthened if periostitis of the upper teeth be found. From a therapeutic point of view, it matters little whether one is dealing with a high-seated dental fistula or with a ruptured abscess of the antrum.

SECOND GROUP : REFLEX AFFECTIONS.

In the foregoing section, we have trodden the path of definite anatomical relations. We now, however, enter the region of the wonderful, in presence of which it will be difficult to conjure up sufficient sobriety and scepticism. If we are to believe the recorded cases (which far exceed in number those of the first group), no part of the eye, from the conjunctiva to the optic nerve, is exempt from disease thus reflexly produced, notwithstanding the fact that the incriminated teeth are often quite painless.

Independently of the earlier authors, Galezowsky and Power have in recent times interested themselves in this subject.

Galezowsky,[28] in his first communication on this subject, says that disease of the teeth may produce mischief in the eye, and *vice versa*. Violent neuralgia of the teeth is often met with in cases of iritis, of choroiditis, and of glaucoma, altogether apart from any dental affection. It has frequently happened that, in these circumstances, teeth have been erroneously and uselessly removed. On the other hand, affections of the eye, even blindness, are caused by extraction of the teeth. During dentition, the appearance of eye disorders, particularly of the phlyctenular kind, is often closely dependent upon that process ; and the frequent relapses stand in intimate relation with the presence of dental irritation. At the time of the first dentition, eye irritation can in many instances be allayed by incision of the gum.* Galezowsky professes to have frequently observed interstitial keratitis during the second dentition and in connection with it ; while during eruption of the wisdom teeth, a similar disease is said to occur. The innervation of the nasal duct, by the *nervus dentalis anterior*, explains the pains sometimes experienced in the molar teeth during catheterism of that passage.

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[28] Galezowsky. Journ. d'ophth., 1872. Sur les affections oculo-dentaires.

In a later communication, Galezowsky[29] draws a distinction between affections of the eye proceeding from dentition and those that appear in consequence of dental caries. According to him, examination of the teeth should never be neglected in the treatment of diseases of the eye, and the removal of any disordered dental condition should always be aimed at. Galezowsky states, further, that under the influence of the *first*

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* Ware, in his *Remarks on the Ophthalmy*, published in 1814 (5th edition), spoke emphatically on this and allied points. "It should not be forgotten,' 'he wrote, " that an inflammation of the eyes is likewise one of the effects which are sometimes occasioned in children by difficult dentition ; and in cases of this kind neither internal nor external remedies can prove effectual for the cure of the ophthalmy, until the tension of the gums be taken off by thoroughly dividing them down to the teeth. In performing this operation, which is best done with a common gum fleam, I usually make two incisions, one perpendicular to the other, in order to be more sure that the wound may not close again afterwards over the teeth. In persons more advanced in years, I have also sometimes seen an ophthalmy accompanied, and perhaps caused, by a decayed and painful tooth ; the removal of which has been necessary, before the inflammation of the eye could be abated." (Trans.)

[29] Galezowsky. Recueil d'ophth., 1885, p. 215-229, and 363-364.

dentition phyctenular ophthalmia, abscess of the cornea, and so forth, may make their appearance. In connection with the *second dentition* the following diseases may be met with :—purulent keratitis, prone to relapse, and rebellious to treatment ; interstitial keratitis, the cause of which is often erroneously ascribed to hereditary syphilis ; and spastic contraction of the eyelids and of the facial muscles. As to the *third dentition*, it is claimed that relapsing purulent and interstitial keratitis may be induced.

Galezowsky claims that the following maladies stand in causal connection with carious teeth. (1) Reflex asthenopia, closely related to caries of the anterior molars. The disturbance of sight appears in a remarkable way, almost always immediately after cessation of the toothache, and it varies according to circumstances. Inflammation of the cornea, of the iris, and of the inner membranes, through the transmission of "a kind of ascending neuritis" by the ciliary nerves. Corneal abscess, running a chronic course, and accompanied by periorbital pain and spastic muscular contraction, seldom arises. Yet Galezowsky describes irido-choroiditis, with loss of the affected eye and sympathetic disease of its fellow, in a case of dental disease. (3) Reflex dilatation of the pupil (Desmarres). (4) Blepharospasmus and cramp of the ocular muscles—affections that may be also produced by imperfectly fitting artificial teeth. (5) Exophthalmus from transmission of inflammation through the maxillary sinus, or, as noted previously, inflammation may pass upwards by the anterior surface of the maxillary bone. (6) Lacrymaæ trouble.

In *L'Art Dentaire*, (May, 1876), Galezowsky maintained his extreme views concerning the influence of dentition upon the eye. He asserted that the symptoms of Keratitis or of Conjunctivitis, that appear quite suddenly in childhood, are, as a matter of fact, due to difficult dentition, and not, as most people suppose, to scrofula. Scarification of the gum, he added, had rendered him good service in such affections.

Nobody will be astonished, therefore, that, holding such views, Galezowsky observed in 1882, in nine months, out of 7776 cases of eye disease, 168 (that is, about two per cent.) to which he assigned a dental origin.[31] In this connection the fact may be noted that, in 1849, Tavignot[30] had declared dental irritation to be the essential cause of phlyctenular eye affections. The latter he treated by watching over the condition of the gums, by the exhibition of counter-irritants, by quinine internally, by periodical purgatives, and, lastly, by a snuff composed of Pulv. Iridis* and Calomel. Tavignot deemed local treatment of the eyes quite superfluous.

Power[32], in an address delivered before the Odontological Society of Great Britain, spoke in a similar sense to Galezowsky. Among other reflex affections of the eye, he specially instanced phlyctenular ophthalmia, the cause of which he not infrequently traced to decayed teeth.

Consonantly with the views of these two authors, Galezowsky at once proceeded to found a school, according to the tenets of which operative dental surgery was to occupy the first place in the treatment of phlyctenular maladies of the eye.

(*To be continued.*)

Leaving the canals open is bad practice, whatever is used to render them aseptic. Though the contents are all removed and the parts perfectly sterilized, there will be trouble. The canals mvst be thoroughly filled and sealed.—T. W. Brophy.

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* A powder made of the Iris Germanica. Trans.

[30] Tavignot. Revue de therap. Med. Chir., 1871, p. 510.

[31] Weinberg. Rec. d'ophth, 1882, pp. 441, and 677.

[32] Power. Dental Cosmos, 1881, p. 497, also Med. Press and Circular, 1883, pp. 458, and 479.

THE USE OF CERTAIN DRUGS IN THE TREATMENT OF PYORRHŒA ALVEOLARIS.*

By Mr. G. N. Skipp.

Mr. President and Gentlemen,—In introducing for discussion the subject of Pyorrhœa Alveolaris, there is no necessity for me to give any description of a disease which no doubt many here are far better acquainted with than myself; nor do I intend placing before you any new theory, or discussing those advanced by the various able writers on the subject. It will, I think, be sufficient to say that I believe the development of Pyorrhœa Alveolaris is dependent on certain constitutional conditions, the disease only becoming manifest where such favourable prior conditions do exist.

The questions whether Pyorrhœa Alveolaris is curable, or whether we have even the means of satisfactorily proving that a cure has in any instance been effected, depend for answer upon the ideas of various operators as to what length of time we may consider as constituting a cure. If that time is put down as from one to three years, we may say that there certainly are cases where a cure has been obtained. Since, however, we have then only removed the local and active symptoms, there still remains the same constitutional condition latent in the system, and ready to re-kindle on the first appearance of the circumstances favourable to its development.

Let us take three fairly typical cases. (*a*) Acute Pyorrhœa Alveolaris due to gastric ulcer; (*b*) Sub-acute Pyorrhœa Alveolaris with exceeding vascular condition of the gums; (*c*) Chronic slow-progressing Pyorrhœa Alveolaris in advanced age, with anæmic gums.

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* Read before the Manchester Odontological Society.

(*a*) The first case finds illustration in the case of a lady twenty-four years of age. The mucous membrane of the stomach being continuous with that of the mouth, acute inflammation of the gums was set up, and followed by Pyorrhœa Alveolaris. This having been treated for some six weeks, the patient left apparently cured, and no visible recurrence appeared for over twelve months. About the end of that time the disease again showed itself, being followed by a second attack of gastric trouble, which necessitated the patient's going away for some months, and several teeth during that period were hopelessly lost. The same treatment was again pursued, but without anything like the previous results.

(*b*) As an example of the second class, (with vascular condition of gums), I may mention the case of a young lady of twenty-eight ; and in this case there was some evidence of hereditary syphilis. The gums were in a chronic state of congestion, and with a thick and copious discharge. Anything like satisfactory results were of only about two, or at the most three months duration, and in this instance constitutional treatment was tried, and had, if anything, *adverse* results.

(*c*) Thirdly, the chronic slow-progressing Pyorrhœa Alveolaris of middle age is shown in the case of a gentleman, æt. 55. Of his twenty teeth, five were beyond salvation, and the rest affected in more or less degree. Treatment was undertaken for the whole of them, and after four weeks there was a marked improvement in the condition of each tooth. Four of the five teeth have been extracted one by one during the past three and a half years, and after the four weeks treatment in the first instance, the disease ceased to show itself in those teeth which were only slightly affected. There was a slight recurrence in the other teeth seven months afterwards which was treated then and has not returned ; the condition of the mouth at the present time being highly satisfactory, considering the age of the patient, and the very anæmic condition of the gums.

We now come to the treatment pursued in each of the foregoing cases.

In the first it should be understood that when the patient first presented herself, the gastric trouble was on the high road to recovery, and the cause was being gradually removed. But there still remained acute inflammation of the gums, which were semi-transparent, and of a bright cherry-red colour, with a copious, but thin discharge from the socket of each tooth. A thin platinum probe passed round the neck of each tooth showed the disease not to have passed far below the outer or comparatively compact tissue of the jaw. The lime or calcareous deposit was carefully removed, and glycerine and tannin with six drops to the ounce of pure carbolic acid was prescribed. The patient was directed to hold water in the mouth as hot as could be borne for ten minutes to a quarter of an hour, and then to apply the glycerine and tannin, rubbed into the gums with the finger, once a day, on going to bed. This was for the first three days, and after then the treatment was to be repeated twice a day till the end of a week. On the second visit an application of saturated solution of copper sulphate (3 drachms to the ounce of water), was applied on a pledget of cotton wool to the pockets surrounding the teeth, and the tannin and glycerine continued without the hot water. At the end of the second week, copper sulphate of full strength was used, and at the end of the third week the discharge had practically ceased, when fine copper sulphate crystals were pushed under the gum with the aid of a quill. At the end of the fourth week, only the glycerine and tannin was continued, as there seemed no further need of the copper. On the fifth week the gums about the necks were carefully dried, and ethylate of sodium applied on the end of a fine platinum probe, and the glycerine and tannin discontinued for three days. At the end of another week the gums were reduced to a pale pink colour, the only remains of the disease being that a little more of the neck of each tooth was showing than before.

The object of the use of the ethylate of sodium, which I consider most valuable in these cases, was to partly obliterate the pockets, which only serve as a receptacle for secretions to lodge, and thus become a source of irritation. After the slough caused by the ethylate of sodium had been thrown off, the new tissue springing up and grasping the necks of the teeth, to a large extent would prevent particles of food being forced beneath the gum.

In case *b*, the patient was treated in conjunction with a medical man who prescribed various drugs ; as arsenic, iodide of potassium, mercury in small doses, and different tonics, without avail. Varied success followed the application of copper sulphate, aromatic sulphuric acid, peroxide of hydrogen, boracic acid, and iodine, both applied and injected, but in no instance could the discharge be satisfactorily put an end to, even for a short period, so that finally the patient and myself mutually agreed that both doctor and dentist were using their endeavours in vain.

In case *c*, it was found necessary to use the copper sulphate only to those teeth with deep pockets. To those which were only slightly affected, ethylate of sodium was applied at once, and a stimulating application of tincture of pyrethrum one ounce and tincture of capsicum half a drachm was all that seemed necessary, instead of the tannin and glycerine used in case *a*.

The object of the treatment in these cases is in some way to alter that condition of the gums which favours the continuation of the disease. The pockets in the gum, left by the ravages of Pyorrhœa Alveolaris are lined with unhealthy tissues, not supplied, like normal ducts and cavities elsewhere with ciliary epithelium to sweep away the accumulation of secretions and débris. Should we only discover the disease in time, these pockets can be obliterated by the use of ethylate of sodium, and treatment resorted to which is adverse to the condition of the gums. If the gums are thick and congested, sedative and astringent applications are indicated.

In the anæmic condition, the ravages may be due to want of larger blood supply, and stimulation would seem to be the course of treatment. I think the prognosis is not favourable where there is considerable movement in the teeth, due to the thickening of the peridental membrane.

For my own part I think there are few cases which we should not undertake, for we can at least mitigate the unfavourable conditions existing, and prolong the lives of many teeth, to the great advantage of our patients, and to this extent our treatment will have been justified, even if we come short of an absolute cure.

Solution of Platinum.—W. L. Dudley finds that platinum black, when moistened with dilute hydrochloric acid on a filter and exposed to the air, is gradually dissolved, platinic chloride being formed. The action seemed more rapid when the filter paper approached dryness. Platinum sponge behaved in a different way, but the effect was not so marked. The chloride was also formed when platinum black or sponge was subjected to the action of a dried mixture of hydrochloric acid, gas and air. Experiments with iridium, rhodium, ruthenium, and osmium, in a finely divided condition, yielded similar results.

(*Journ. Am. Chem. Soc.*, xv., 272.)

British Journal of Dental Science.

LONDON, MAY 15th, 1894.

PENAL CLAUSES OF MEDICAL ACTS.

Several of our correspondents have sent us copies of a circular which intimates that we are in some way responsible for it, and our readers may expect an explanation. We have always endeavoured to regard Dental Politics with an open mind; we have been able to look upon the Dentists' Act with optimistic inclinations; and we have felt justified in recommending patience, where a display of that virtue seemed to promise the most solid results. But we have never, nor do we now, condemn the lawful associating together of men who have common aims in view, and it is unnecessary for us to say anything further than that uncalled-for personal allusions seem to us to weaken, rather than to strengthen, a cause.

Those who are dissatisfied with the Dentists' Act may at all events spare a little pity for the medical practitioner whose professional life is regulated, more or less, by weaker penal arrangements in regard to unqualified practice. As we have before pointed out, our Act, and the Veterinary Surgeons' Act, are stronger in this respect than the Medical. Certainly, concerning registration, we cannot understand any strong difference of opinion amongst our fellows as to the provisions of the Dentists' Act, so far as it goes. Some no doubt would welcome still greater stringency, but in connection with the establishment of a legalised Register, it is probable that the only really dissatisfied practitioners are those whose names do not appear upon it.

From time to time its penal clauses have been put into effect, and the gradual evolution of its application, as tested in law courts, appears to have been watched with interest, perhaps tinged with envy, by the medical profession. We, ourselves, should consider the times as somewhat out of joint for appealing to Parliament for an extension of the penal clause, but we can scarcely blame the medical practitioner for expecting the State should protect the public in medical matters to, at least, the same extent as it does for Dental and Veterinary practice.

The Parliamentary Bills Committee of the British Medical Association has had under its consideration a proposed amendment of the penal clauses of the Medical Acts. The chairman pointed out that when the Act was drafted every effort was made to get a more stringent penal clause but public opinion, at that time, would not go further than to make the assumption of a medical title illegal. It is now, however, thought that a considerable revolution has come about, and even lay papers have published articles in favour of amendment. It is not proposed to attempt to interfere with unqualified practice as such, but, as we understand it, simply to obtain the same provision as is secured by the Dentists' Act. The suggested clause does not contain the words "wilfully and falsely" as applying to the assumption of a title, which have hitherto constituted a difficulty in procuring a conviction. It asks that any unregistered person who shall take or use any title, style, addition, or description, directly or indirectly implying that he is registered or that he is specially qualified to practise medicine or surgery, or any branch thereof, shall be liable to be fined. We think it should be made clear that the "using" distinctly includes the application of a title to a place, as well as to the person; for although the point has been favourably decided under Clause III. of the Dentists' Act, it might save future trouble in an appeal, or a possible evasion by repudiating personal responsibility in attaching the title to premises where the practice is carried on.

Wholesale Extraction of Teeth.—On another page we publish a report of a case tried at the Liverpool Assizes. A servant girl obtains £150 damages from a dentist in consequence of his manager having made her edentulous without her permission. Naturally the daily Press have not been slow to take advantage of such a case, and a good many smart paragraphs and leaders have no doubt resulted. The details brought out in evidence are, however, sufficiently striking to engage the attention of dentists. One hardly knows in what way to regard the boldness with which an unqualified and unregistered person administered chloroform. Even if it was an audacity born of ignorance the use of the stethoscope mentioned at the trial might still be part of the play. The whole case, and especially the remarks of the Judge, cannot tend to raise the practice of dentistry in the eyes of the Public. It was stated that the Defendant himself was ill; the verdict is not calculated to make him feel better nor to enable him to answer any questions which may be asked by the General Medical Council.

An Action for Malpraxis.—A case has just been decided in favour of the medical attendant, where the patient claimed compensation for alleged negligence. A coachman sprained his ankle; after returning to his occupation the joint became worse, and finally amputation was found necessary in consequence of tubercular disease. It was sought to show that the doctor in treating the sprain, and later on in making an exploratory incision, showed a want of skill and care. The *Lancet* takes the opportunity of protesting against the existing conditions which leaves a practitioner helpless against vexatious claims. The delay occasioned by a civil trial may lead to months or years of bitter suspense before the defendant can leave the court "without a stain upon his character." The *Lancet* suggests the institution of some court comparable to a grand jury, in order to have the facts in such cases investigated without delay.

THE TREATMENT OF DIPHTHERIA.—Bianchini records the results of forty-five cases of varying severity. The method of treatment consists in the local application to the patient's neck of fomentations moistened with a two per cent. solution of carbolic acid in lead lotion. These should be used at as early a stage as possible, with the idea of acting on the micro-organisms and preventing their further spread. It seems that in the case of children, the phenol is easily absorbed through the skin, and the vapour also enters the mouth. In bad cases the pharynx is painted with a mixture of salicylic acid, alcohol, resorcin, and glycerine. Only two cases were lost; the treatment extended from six to eighteen days on an average, but in one case to a month. Nine other cases, treated by other practitioners, all recovered.

THE TREATMENT FOR IMPACTED DENTURES.—At a recent inquest, the jury seem to have come to the conclusion that the medical man should have sent the patient to hospital, for operation, immediately after failing to extract the foreign body at a first attempt. Although the medical officer of the infirmary appears to have justified the delay, the jury censured the doctor. The artificial teeth were recovered on the second day after the accident. Tracheotomy became necessary on the following day, but the patient died. The urgency for other operation than an attempt to extract through the mouth may depend upon the size, shape and construction of the denture, and, when possible, it would be well to supplement the patient's statements by a consultation with the dentist.

NATIONAL DENTAL HOSPITAL.—The President and Council of the Students' Society are issuing invitations to a Conversazione to be held at the New Hospital on the 23rd inst. Music and other forms of entertainment will be provided, and we have no doubt a pleasant evening will result. Mr. Tice, the Hon. Secretary, asks us to remind old students that they should apply for the necessary ticket without delay.

IRON AND THE TEETH.—In the course of a very interesting communication to *The Cosmos*, Prof. MILLER has something to say as to the presence of iron in and upon the teeth. He does not agree with Moffat, who thinks it is the cause of green-stain, but he explains the colour found in the incisors of many rodents by the presence in the enamel of much iron in the form of oxide. If carious teeth are split open and tested with ferro-cyanide of potassium there is usually a crescent shaped blue line to be seen just on the boundary between the carious and normal dentine. Prof. Miller examined the teeth of a hundred and fifty iron-workers and found that in nearly all who had been some time so employed, there were brown spots or deposits on the teeth. In contradistinction to the copper deposits, iron was found more often in connection with the lower than with the upper teeth. No marked action of the iron on the teeth was noticed, but in most cases there was so much tartar present that the filings did not come into contact with the enamel.

To get a tin model on which to vulcanize, a plaster cast free from imperfections or blisters is carefully dried and dipped into melted stearin. When hardened, a sand mould from this model is made in the usual way, into which tin is poured, and when slightly congealed at the edges the still fluid portion of the tin is poured back into the melting ladle. A thin shell of the tin will be left as a lining to the sand matrix. This shell furnishes a perfect model after the hollow interior is filled with plaster. If the pouring back is delayed too long the tin shell will be found to be too thick, but the right moment for repouring will be easily found by a little experience. Before the plaster of paris is poured into the tin shell, the latter is to be cut at different places with a very thin saw from the outer margin toward the alveolar ridge. These thin incisions will permit the removal of the tin shell after vulcanizing, by bending the sections of tin to the inside, so that the plate may be readily separated from the model. Plates so vulcanized need no further polishing on the palatine surface.

Zahntechnische Reform.

Manipulative Miscellany.

It is requested that all new instruments or articles which it is wished to have described under this heading, be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being to give practitioners a description of everything new, on its own merits and without any intention or wish to pit one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

A NEW BLOW PIPE.

The Midland Dental Manufacturing Company have introduced a new form of blow-pipe, which, although at first sight complicated, seems to answer the purpose. The apparatus consists of a metal air-chamber, or reservoir, with a blowpipe attached by a swivel joint. A nozzle in the pipe admits gas by a rubber tube, and there is a similar arrangement for the admission of air to the reservoir. The latter is filled by means of a small air-pump which is clamped on to the bench. The pump has a ring fitted over it attached to chains and a stirrup, so that it may be worked by the foot. The advantages claimed are that there are no parts to wear out as in leather bellows, and that a constant blast can be maintained and regulated to the size of flame required. A hand-pump is supplied if preferred.

CORYL.

This name has been given to a product for which Messrs. G. Mengel & Co. are the agents. It is supposed to give better results than Chloride of Ethyl for obtaining local anæsthesia. It is sent out in a handsome nickel-plated cylinder, called a Coryliser, from which a fine spray escapes on the turning of a screw. The receptacle can be refilled with 100 grammes for 6s. 6d., and this quantity is said to suffice for twenty-five extractions. According to our experience there is one drawback. Intending to freeze the gum we found the vessel empty, and there does not appear to be any distinct method by which one can tell before-hand that the supply is exhausted.

Abstracts of British & Foreign Journals

THE VAGARIES OF MODERN PHARMACY.

By Prof. B. J. Stokvis, Amsterdam.

The services rendered by chemistry to therapeutics is not an exhausted subject. Certainly our predecessors already possessed a goodly medicinal treasury, but it seems very insignificant when compared with what we now utilize. Chemistry has loaded materia medica and pharmacology with wealth ; it is the mother of new remedies, and we are proud of its aid ; it has given us our anæsthetics, antiseptics, hypnotics, and antipyretics. These groups of remedies enable us to give relief in many cases where our forefathers were quite helpless. To them chloroform, ether, carbolic acid, iodoform, creasote, chloral, the salicylates, and antipyrin were all alike unknown. But here, again, and more so than with respect to the alkaloids, there are shadows in the picture. Chemists and chemical manufacturers add more and more to our store of remedies day by day without stint or truce, without heeding the despairing cries of physicians already overstocked with drugs. We are tempted to cry out for mercy. This is no exaggeration, for these new chemical products are all forced upon the same therapeutic market under the most attractive names, and all proclaimed aloud with the noise of most perfect advertising machinery. This is now done to an extent that, in my opinion, is detrimental to the interests of therapeutics. I am not speaking of quack remedies, the orvietana of our day, of those secret specifics which the medical man views with wholesome horror, to which, and to whose use, the old adage, *Trompeurs*, *Trompes*, *Trompettes*, can be so well applied. I am speaking of genuine well-known products ; for, unfortunately, modern industrial chemistry, in manufacturing and in placing at the disposal of medical men these drugs, does not at all object to their being purchased by the general public. If this be not so, why do their proprietors select for their names the fascinating names that act as veritable flags to attract the public—for instance, anti-nervine, anti-phthisine, anti-rheumatine, anti-dysenterine, and, most expressive of all, migrainine. I fully appreciate the difficulty of finding new names for these new products, and can understand that the manufacturer would shrink from giving them the names derived from their chemical composition, for these, generally speaking, could only be pronounced with linguistic gymnastics and intolerable strain upon our memory. I must, with great regret, note that we have departed from the ancient method, which taught us to denominate new products according to their origin, and have followed freely a course of seeking for euphonious, sonorous names, proclaiming the therapeutic use and effect of the drugs designated by them. It is not sufficient nowadays to have a good remedy—say agathine; we must be assured of its superlative excellence, hence aristol. Do you want to prescribe for a patient who is "out of sorts," you have euphorine; for a lack of appetite, you have orexine. You desire to procure sleep for him; you have hypnal, hypnon, somnal, or somniferine. You wish to lower a febrile temperature; do not let the emergency trouble you, for you have antipyrin, antifebrine, antithermine, thermomine, thermofugine, pyrodine, and thermodine. You want to assuage pain? *Eh bien*, you have awaiting your orders analgesine, analgeine, exalgine, exodyne, and neurodyne. Or you have to deal with a case of heart disease; you have cardine. Or you desire to stimulate urinary secretion; you have diuretine, pheduretine, and uropheine. To check the formation of pus there is a remedy termed pyoktanine; and to combat spasms antispasmine. I do not wish to exhaust your patience, and I will spare you the enumeration of the antiseptics, the disinfectants, the microbidines *e tutti quanto*. Ten years exactly have elapsed since my honoured colleague Professor Rossbach, of Jena, published an article full of wit and sound sense on these tendencies of modern therapeutics, and in those days we had not the long lists of antiseptic and antipyretic remedies. Nor was it then imagined that the essential extracts of the organs of animals, of which the late Professor Brown-Sèquard and M. C. Paul were the earliest to explain the therapeutic value, would find a place in materia medica, nor cultures of microbes. It was not foreseen that we should have to chronicle in 1894 the sale not only of sequardine, but also of veritable bacterial products such as tuberculine, tuberculocidine, antituberculine, antitoxine, κ τ λ. How shall we check the fury of this flood? There seems no reason why it should come to an end.

The Lancet.

PREPARING TEETH FOR MICROSCOPIC STUDY.

By W. E. Christensen, D.D.S., Philadelphia.

Weil's Method.

When the tooth has been extracted, it must immediately be brought into some conserving fluid—as alcohol or watery solution of bichloride of mercury—to prevent the pulp from shrinking. Also, in all further manipulations, as cutting, sawing or grinding the sections, careful attention must be given that the tooth or section is at no moment without an excess of moisture. If teeth of rabbits or dogs are used, it must be remembered that the tissues of the pulp stick more to the wall of the pulp-chamber than in human teeth. This is important at the first opening of the tooth. If human teeth are taken from dead bodies, it must not be more than six hours after death.

In order to enable the preparing drugs to enter the pulp, it is necessary to open the tooth and partially expose the pulp in such a manner that the pulp is not hurt. For this purpose we make a section with a sharp, fine saw on both sides of the tooth about midway of the crown, and cut off the part with a pair of strong excising or splitting forceps. The end of the pulp will then be exposed without being hurt. At the apex of the root a short piece is cut off in a similar way. For fixation of the tissues, the tooth is placed in a saturated solution of bichloride of mercury in water for about eight to twelve hours, after which it is washed in running water for two hours.

To harden the tissues of the pulp, the tooth is then placed in alcohol of low degree, the strength of which must be gradually increased from thirty to fifty per cent., and from fifty to seventy per cent., leaving the tooth from eight to twelve hours in each of the three stages. From the bichloride of mercury there will be left a black precipitate on the specimens which can now be removed by placing them for about twelve hours in ninety per cent. alcohol to which one and one-half to two per cent. tincture of iodine has been added. The iodine is removed by placing the specimens in pure alcohol until they recover their former white appearance. After the process of hardening in alcohol, the teeth can be cut in two or three sections by means of a fine, sharp scroll-saw. The next step is to stain the specimens. There are a great number of dyes used for staining preparations for microscopic studies. Dr. Weil, in the description of his method, mentions a great many, but he says he has obtained the best results with "aqueous borax-carmine," prepared in the following manner :

Eight grams of borax are powdered in a mortar together with two grams of carmine, and then mixed with one hundred and thirty grams of aq. dest. After twenty-four hours it must be well filtered, and is then ready for use.

The sections, when taken from alcohol, are washed in running water for about fifteen minutes, and then transmitted to the dye for twelve to twenty hours, in which time they will become intensely coloured. The excess of dye is removed be placing the sections in seventy per cent. alcohol, to which one gram of hydrochloric acid has been added to each one hundred c. c.m. for as long as they have been in the dye. It is then well to place them in ninety per cent. alcohol for about twelve hours, and afterwards in oil of cloves for one or two hours. This last procedure makes the specimens more transparent.

We have now come to the treatment with Canada balsam. This must in the mean time have been prepared in the following manner : A quantity of Canada balsam, as obtained from the druggist, is placed in an evaporating dish, and kept over boiling water until the balsam, by cooling, becomes solid and brittle like glass. This takes from twenty to thirty hours, according to the quality of the balsam.

When the sections are taken from the oil, they must be cleaned with pure xylol, and then quickly immersed in chloro form, to remain twenty four hours. Then sufficient of the hardened Canada balsam is added to the chloroform to give a weak solution, and after another twenty four hours the solution must be saturated with Canada balsam ; but the solution containing the specimens is then again put into an evaporating dish, and placed over hot water until the balsam once more becomes solid. As the chloroform boils at a low temperature (60-61° C), the heat from the water must, to begin with, not be higher than about 60° C.; later it can be increased, but altogether slowness of the solidifying process is in favour of the results. Consequently, the procedure takes from twenty to thirty hours.

When the balsam, by cooling, becomes solid and brittle, the specimens can be cut out with a small, sharp chisel, and with a fine, sharp scroll-saw be cut into sections suitable for grinding. The grinding is done as when mall sections of bone are ground for microscopic study, always under application of excess of water. The pressure must be very gentle, especially when the specimen gets thin; the result now depends somewhat upon the skillfulness of the operator. When the section is thin enough, which must be controlled under the microscope, it must be carefully cleaned in distilled water, and finally mounted in Canada balsam.

This whole procedure may at first seem rather complicated, but the results certainly repay the labour.

The Dental Cosmos.

PYORRHŒA ALVEOLARIS.

By C. N. Pierce, D.D.S., Philadelphia.

Observation and interpretation must enter largely into an intelligent comprehension of the subject, and in the discussion it must be borne in mind that we have different abnormal states, which are liable to be spoken of as having a common origin because of the similarity in results, this necessarily leading to antagonisms and embarrassments.

Calcic pericementitis may have its origin at the gingival borders, the tartar acting as a local and mechanical irritant, with the train of concomitant evils, such as irritation, inflammation, formation of pus, and absorption of gum and alveolar process. This may be treated locally, and may be reported as a case of pyorrhœa cured, when the most that can be said of it is that it was the result of a local cause and has been treated and cured by topical applications.

To avoid such complications in diagnosis, let us first recognize the fact that we have three distinct, abnormal conditions affecting the gums, pericemental or alveolo-cemental membrane, and alveolar process. The first is gum inflammation and destruction, caused by a mechanical irritant—the salivary calculus of which we have just spoken. Second, inflammation of the gingival borders without the presence of tartar—Dr. Black's phagedenic gingivitis and pericementitis. The third is a pericemental irritation commencing at or near the apical extremity of the root, due to the presence of some morbid composite of the blood, exuded with the plasma and infiltrating the alveolo-cemental membrane, and frequently deposited or precipitated upon the root of the tooth near its apex. This latter I designated true pyorrhœa alveolaris, or hematogenic pericementitis, and so intimately is it associated with some other local manifestation of a gouty diathesis, that I have believed and do now believe it to be but another local expression of that systemic condition. This assumption has been confirmed by the fact that the accumulation which is so frequently found upon the roots of teeth near their apical extremity, by careful chemical analysis, has been proved to be composed of sodic urate, calcic urate, free uric acid crystals, with some calcic phosphate and carbonate. Nor is this the only evidence of the correctness of this theory. Cases which had been treated for months, and indeed for years without more than modifying the progress of the disease have, when the patient has been subjected to rigid constitutional treatment, such as restriction in meat diet to simple albuminous food, with such remedies administered as are usually beneficial in gout or a uric acid diathesis, responded promptly—the inflammatory state with its concomitants, pus formation and process absorption, arrested, and if not too far progressed towards dislodgement, the teeth have become comparatively firm and free from pain.

I might in a few condensed propositions give conclusions which appear to me to be fully warranted:

First. The inflammatory stage of true pyorrhœa alveolaris primarily begins in tissues on the side of the root near the apical extremity, and secondarily advances towards the gingival borders.

Second. The cause of this inflammation, pericementitis, is the plasma exudation from the blood vessels, freighted with salts, which in their deposition and crystallization upon the cementum of the root exert the influence of foreign bodies, and so act as irritants.

Third. The salts in question as disclosed by chemical analysis are calcium and sodium urates, free uric acid and traces of calcium phosphates.

Fourth. The chemical nature of these salts indicates a condition of the blood in which there is an excess of uratic salts and uric acid, due either to increased formation or imperfect elimination. The excess of these salts general pathologists regard as indicative of a faulty nutrition, and the immediate cause of a series of local disturbances to which the term gouty has been applied, the nutritional disturbance being known as the uric acid diathesis.

Fifth. Results from constitutional, in connection with the usual local treatment, in a number of well authenticated cases of pyorrhœa, have been so marked and satisfactory that the writer feels fully justified in his assumptions regarding the origin of the disease.

The Dental Practitioner.

TRANSPLANTATION.

By Dr. Louis Ottofy, Chicago.

Regarding the present status of the subject, he said : The operation has received but limited recognition in the permanent literature of the last few years, and reference to it is made more in the spirit, as if the operation were merely a curious experimental novelty. My observation and experience in implantation leads me to express the following statements :

1. Implantation has been practised for a sufficiently long period to entitle it to be accepted as a legitimate cperation in oral surgery, in regard to which the dental surgeon should have the privilege to perform, assuming the attendant risks as he is doing in other operations. This statement is made as the result of observations extending over a period of nearly eight years
2. That in view of the fact that all dental operations are more or less of a transitory character, implantation deserves to be classed as a permanent operation, in the same sense in which other operations performed by dentists are considered permanent, and that it should not be considered merely a fanciful experiment.
3. That no operation of the dentist so nearly reproduces nature as that of an implanted tooth, and the result, when successful, in appearance and comfort cannot be excelled by any other operation within the domain of the entire science of dentistry.
4. That the operation should not be performed in any cases, except those which have been as carefully selected as they would be, and as they are, for other operations.

MARGINAL LINES OF FILLINGS.

By George J. Dennis, M.D., D.D.S. Chicago.

The writer believes that with the proper shaping of the marginal or border lines of fillings, many if not all of the failures of proximate fillings may be obviated. The paper deals with the marginal lines of those simpler proximate fillings of the six anterior teeth, which are met with every day in practice.

First, in logical order, according to their simplicity, may be studied those very small cavities, usually called pin-head cavities, which although so styled, are seldom so large on their external surfaces. These cavities are said by Dr. Ottolengui, to appear directly at the "contact points" of the approximating teeth, while Dr. Black whom all recognize as an exceedingly acute observer, asserts that they do not appear at the contact points, but at points just rootwise of the contact points. The observations of the writer have been similar to those of Dr. Black, that these decays do appear at points toward the roots of the teeth. From this point, decay progresses in all directions lingually and labially, and cervically and morsally. The progress, as a rule, is more rapid and extensive in the cervical and lingual directions than in the labial or morsal directions. Dr. Ottolengui states that "in the six anterior teeth the approximal cavities should be prepared as small as possible, consistent with reaching strong edges." He argues, after making this statement, that they do not possess "self cleansing surfaces" when extended until the marginal lines lie without the point of contact, as stated by Dr. Black, and quibbles over the use of the term, self cleansing. He says also that they should be made as small as possible for æsthetic reasons, because less of the filling material is visible when the cavities are prepared after this manner, than when prepared by extending the margins so that the points of contact and the points of first decay shall be entirely included within the marginal lines. He states practically that he permits the margins of his fillings of this class to lie against the adjoining teeth. Thus, even if the fillings are made as small as possible for æsthetic reasons, they must, by reason of the inherent weakness of the margins of his fillings (be they ever so perfect), invite a recurrence of decay at those points, where he himself says decay makes its first appearance. As for the argument based on æsthetic considerations, this can be passed by lightly, for every observing dentist, as well as his observing patients, has noted the rapidity with which these small fillings in proximate surfaces, discolour and become almost as black as oxidised amalgam fillings in the same location. If, for no other reason than that of the æsthetic qualities for which Dr. Ottolengui argues so strongly in his papers, these cavities should be extended so that the labial margins should present a clean polished gold appearance, rather than they should show discouloration, either by reason of real discolouration, or on account of the peculiar effect of lights and shadows at these points. For prevention of decay, it is almost axiomatic that the marginal lines of these small cavities should be extended, not only beyond the contact points, but beyond the points of first decay, which Dr. Black states, lie just rootwise of the contact points. Not only should the marginal lines of these fillings be extended so that every part shall be exposed to the cleansing action of brush or pick, but the contour of these fillings, small as they are, should be exaggerated, so that placed in approximating teeth, they shall only touch at the most central points of their surfaces. This may be done without marring the appearance, for the rays of light which fall on such fillings, may be so regulated that the real projection of the filling beyond the natural tooth contour will not be apparent. This principle was first suggested by Dr. Edmund Noyes, in connection with large contour fillings, in which a real diminution of the size of the fillings, could be made without affecting their apparent size.

The next class of cavities in these surfaces are those in which decay has progressed until both the contact points and points of first decay have been passed, without involvement of either the labial or lingual plates of enamel, although the dentine next the lingual plate is exceedingly thin. In these cavities again extension of the margins is necessary until the lingual as well as the labial plates of enamel are entirely protected by the gold from contact with the approximating teeth. These lingual margins are so often permitted to lie in contact with the adjoining teeth that especial attention should be called to them, for probably a greater percentage of failures may be found along these margins in this class of cavities than in the margins of the larger cavities. It is a great temptation to utilize the lingual plates in these cavities as walls for the fillings without cutting away the edges until they are strong and solid and the margins are clear of the approximating teeth. Too often the disk is passed between the teeth when these cavities present themselves and the margins prepared so that all except possibly the labial margins are in contact with the teeth which approximate them.

The next class of cavities are those in which decay has continued until the lingual walls have been broken down to a considerable extent while the labial remain comparatively firm. In this class the marginal lines should be extended until enamel walls are obtained, fully supported by dentine, and until the entire marginal line of the cavity is clear of the next tooth. These lingual margins should be also extended with regard to the lingual fossæ found in the central and lateral incisors, and when any tendency toward sulci is noted, they should be extended to include them.

Next, have been classed together those cavities in which the labial as well as the lingual enamels have been broken away, with only the mesio-morsal or disto-morsal angles remaining, although sufficiently supported by dentine to preclude the necessity of cutting off these angles. The margins in these cases should be trimmed in much the same manner as with the previous class, having regard for the strength of enamel at the mesio and disto-morsal angles, with sufficient bevel at these points to preclude the feather edge of gold which is apt to draw away from the margin. Here again in the filling, the contact points should be restored in gold for the preservation of tooth structure at the margins.

To the next class belong those in which decay has caused the complete breaking down of the mesio-morsal or disto-morsal angles. They should be formed entirely with regard to the strength of the enamel and its lines of cleavage. As with the other classes, the margins must be extended until all the lines are away from contact with the opposing teeth. Here, the lines may be so formed that a shoulder results near the cervical margin which greatly assists in retaining the filling in place.

The Dental Review.

GOLD IN DENTISTRY.—A French statistician, Mennier, estimates the consumption of gold for purposes of dentistry to amount annually in the United States to 1,800 pounds. Mennier declares that a century hence American cemeteries will contain more gold than now exists in France.

ON COAGULANTS IN THE TREATMENT OF THE PULP-CHAMBER AND CANALS.

By Edward C. Kirk, D.D.S., Philadelphia, Pa.

Readers of periodical dental literature will have observed, during the past few years, statements by writers and speakers upon dental therapeutics to the effect that medicaments which possess the property of forming a coagulum with albuminous organic matter should be excluded from the treatment of pulpless teeth. Such statements are made with growing frequency, quite regardless of the excellent clinical record made by coagulant antiseptics, and especially since the able researches of Professor Miller and Professor G. V. Black have thrown so much light upon the antiseptic value of a number of substances which are devoid of the coagulating property, and which it has been proposed to utilize instead of coagulants in pulp-canal treatment.

The objection which is made to the use of coagulants by those who condemn them in this connection is based upon the assumption that when introduced into a pulp-chamber their action is to superficially seal the dentinal tubuli by forming an impenetrable coagulum with the orificial end of their albuminoid contents. This is believed to produce the twofold result of preventing the further entrance of the coagulant or any other antiseptic, and also of hermetically inclosing within the tubular structure of the dentine a certain quantity of non-sterilized or infected organic matter, which may by its decomposition act subsequently as an irritant to the pericemental membrane. If the major premise of this assumption be a correct statement of the actual conditions, then we must admit the corollaries as deduced from it; but in so doing we necessarily admit that our best-known and most generally used antiseptics in the treatment of pulp-canals—viz., carbolic acid, zinc chloride, and corrosive sublimate—do not penetrate the dentine structure, and consequently sterilize only a superficial film of organic matter lining the pulp-chamber and canals. The long clinical record in favour of the substances named would seem to indicate that their action in the pulp-canal is something more than a superficial action, and that their penetrating power is not self-limited because of the coagulating property which is common to each. The popular objection to the use of coagulant antiseptics is fairly stated by Dr. A. W. Harlan, who appears to have been the originator, or at least the chief exponent, of the assumption. He says in his report as chairman of Section V of the American Dental Association, in 1889 (*vide* Transactions), referring to Professor G. V. Black's paper on Antiseptics. "The above paper practically opened up the subject of the value in dental practice of the agents which, with a few minor exceptions, may be classed as non-coagulants. . . The experiments above referred to, in fact, refute the idea that coagulants are necessary to accomplish the destruction of microbes. It is not denied here that coagulants are useful medicaments in dental practice, but we maintain that in the treatment of pulpless teeth for purposes of disinfection they are not only useless but detrimental: *in fact, their use defeats the object sought to be obtained. They coagulate the organic surface with which they come in contact, and prevent their own diffusion.* A diffusible disinfectant is constant and ever-acting. One that coagulates, cooks, or destroys is not indicated in this line of practice"

It is evident that the question with which we have to deal at present is simply as follows: Do coagulant antiseptics produce with albuminous matter a coagulum which is a barrier to the further diffusion of the coagulant or other medicaments? Or as has been asserted, are coagulants self limiting in their action? An equally important subject for consideration is the question of the antiseptic value of the coagulum so formed, but this is apart from the immediate question at issue.

If the assumption be correct that coagulants seal up the orifices of the dentinal tubuli with an impenetrable coagulum, and are therefore self-limiting in their action, it would seem that we are confronted in this case with a definite exception to the well-established laws of diffusion known as osmosis.

The use of coagulants such as carbolic acid, zinc chloride, sublimate, &c., has not only overwhelming clinical evidence in its favour, as most can no doubt testify, but it is actually proper on theoretical grounds, and fully in harmony with the laws of osmosis. The author does not wish to be understood as favouring the indiscriminate use of these substances, for they possess individual characteristic properties and effects which may rightfully exclude their usage under certain conditions. What he wishes to emphasize is that their coagulating property cannot be scientifically or clinically urged as an objection against their proper use. The observed natural tendency of all fluids, whether liquid or gaseous, to diffuse, interpenetrate, or mix with one another, is called diffusion. It is a natural tendency dependent upon molecular attraction, and takes place without mechanical action and in apparent disregard of the force of gravitation. It is based upon a well established force termed capillary attraction, or adhesion where the surfaces of different kinds of molecules of matter cling or adhere together. When such diffusion of liquids, however, takes place by means of or through a membrane, it is called osmosis. Both diffusion and osmosis take place in accordance with well-defined physical laws, whose formulation is the outcome of numerous experiments and careful observation by men of different eras and climes. The general result of their work, which was as careful and ingenious as it was varied, led to but one resulting generalization,—viz., that capillary attraction, so called, is the fundamental principle underlying all phenomena of diffusion or osmosis. Whether it be the absorption of nutrient pabulum in our bodies, the suction of sap from the earth by flower or plant, the gathering of clouds overhead, or the penetration of coagulant antiseptics in the treatment of pulpless teeth, the same force of adhesion or capillary attraction is the basis of the phenomena. There is no essential difference between penetration or diffusion *in* or *out* of the body, between the so-called vital or the physical. This point seems to be definitely settled. The main conditions favourable to osmosis, briefly stated are : 1. That the substances to osmose be crystallizable and readily soluble. If they are amorphous (colloid) and imsoluble, they will not penetrate the membrane. 2. Since substances have to pass through the membrane in order to meet each other, the membrane itself must be capable of inbibition, of being wetted by both solutions ; in other words, of taking them up into its substance. 3. Both liquids must be miscible with each other. If they are not, diffusion cannot take place. 4. They must be of different densities or dissimilar in kind.

This much for general diffusibility of liquids. The *rate* of diffusion depends upon additional factors, since it is well known that membranes do not imbibe all solutions with the same degree of activity. Liebig has shown that distilled water is always taken up in greatest quantity, and that crystallizable solutions enter membranes in an inverse ratio to their density. The greater the density, provided it does not exceed a certain percentage, the stronger will the current towards itself be (endosmosis). Weaker solutions diffuse more rapidly toward strong than *vice versa.* Albumen is the most powerful producer of endosmosis, hence it is that it plays such an important part in absorption in the human system. Heat, slight elevation of temperature, is another factor in rapid osmosis, as are the variations in density, pressure, affinity, and nature of liquids to be diffused.

For gases, the law is more uniform, namely: That they diffuse in inverse ratio to the square root of their density. But how do coagulants, crystalloid agents that coagulate albumen or the albuminous constituents of the permeable membrane act?

Mialhe has shown that these substances, although somewhat slowly, are nevertheless taken up by and diffused through membranes. He has likewise shown that they are also taken up by blood vessels. We have in the three substances mentioned at the beginning of this paper—viz., chloride of zinc, carbolic acid, and sublimate—typical coagulant antiseptics, whose properties are quite familiar to all. If a test-tube containing a strong solution of zinc chloride, say to one-fourth or one-third of its depth, have carefully added to it, so as not to agitate the surface of the zinc solution, an equal bulk of fresh egg-albumen, we will observe at the contact point of the two liquids the formation of a dense white opaque film, which is the coagulum formed by the union of the two substances. Observe at this point that we have at once fulfilled all the conditions needful for osmosis. We have the crystalloid zinc solution, the colloid albumen, and the membrane consisting of the coagulum separating these two liquids of unequal density, both with strong affinity for each other and both capable of wetting or penetrating the membrane. We are therefore justified in expecting osmosis to take place, and from what we already know of the power of albumen to induce endosmosis—that is, osmosis toward and into itself—we should naturally expect the coagulum to proceed throughout the entire extent of the albumen column. This, as a matter of fact, it does in a comparatively short time, and if we have been careful to previously mark the original level of zinc solution, which will indicate the surface of the first contact of the two liquids, we will find at the close of this experiment, when the albumen has completely solidified, that the level is exactly as it was originally, showing that the result has been brought about by osmotic action regardless of gravitation, and is not produced by a mere mechanical mixing of the liquids. It shows incontestably what is more to our purpose, that the assertion that "coagulants defeat the object sought to be attained, by coagulating the organic surface with which they come in contact, and prevent their own diffusion," is an error simply because it is not in accordance with the facts. The experiment just noted has been carried out with sublimate and with carbolic acid respectively, with exactly similar results so far as the osmotic feature is concerned, the only difference being in the relative rates of penetration or diffusion of the coagulants into the albumen.

Statements are presented as evidence deduced from careful experimentation, to show that none of the coagulant antiseptics which we are considering are self-limiting in their action, so far as egg-albumen or the soft tissues are concerned. That there is a marked difference in their relative power of penetration is evident, but it is equally evident that they are amenable to the forces of osmosis, and permeate tissue in accordance therewith.

Now, with respect to the possibility of their osmosis in the dentine structure. To settle this matter the following experiments were undertaken: Recently extracted, sound teeth, which had been preserved in a dilute solution of boroglyceride, were opened from the masticating surface, or in the case of incisors, from the lingual surface, with a drill, and communication thus established with the pulp-chamber, care being taken to disturb the pulp as slightly as possible. The aperture of entrance was enlarged and made conical, with the base of the cone away from the pulp-chamber, and into this was fitted with cement a glass tube with its end drawn down to a funnel or cone shape, so that it fitted into the cone-shaped aperture of the tooth as accurately as possible. The apical foramina of all of the roots so prepared were closed by dipping the root-ends into melted Canada balsam. By this arrangement a funnel-like tube in direct water-tight communication with the pulp-chamber was secured. In the experiments of this character thus far carried out, observations have been confined to zinc chloride and sublimate. Into a number of the teeth thus fitted with tubes a saturated solution of zinc chloride was poured, and similarly in others sublimate in saturated solution was used. Those containing the zinc salt were immersed up to the anatomical neck of the tooth in egg-albumen contained in test-tubes. The funnel-tube attached to the tooth was passed tightly through a cork, and this arrangement maintained the tooth at the determined depth in the albumen. It is now evident that if the coagulant antiseptic, zinc chloride, is self-limiting in its action, and sets up an impenetrable barrier to its own diffusion, none of it can possibly pass through the root-walls by osmotic action. On the contrary, if this be an error, then in the course of time the zinc salt will find its way through the structure of the root and manifest its exit by coagulating the albumen surrounding the root. In these experiments, after twenty-four hours there was evidence of the forming of coagulum upon the outer surface of the root, and two days later the coagulum had spread so as to come in contact with the walls of the containing test-tube and completely envelop the root throughout its entire length.

From this we may infer that zinc chloride is not a self-limiting coagulant when applied to the hard structure of the tooth-root. The tests with sublimate were arranged somewhat differently with respect to the end reaction, to demonstrate the exit of the sublimate through the root-walls. Instead of immersing the roots in albumen, this phase of the experiment was varied by using a solution of potassium iodide, to which mercuric chloride was previously added until the precipitate of mercuric iodide was no longer redissolved; the solution was then filtered clear. It is evident that the slightest addition of mercuric chloride to such a solution will be made manifest by the production of the characteristic red precipitate of mercuric iodide. Teeth prepared as for the zinc chloride test, filled with a saturated solution of sublimate and immersed to the anatomical neck in the iodide solution, showed the characteristic colour reaction in three days. Therefore corrosive sublimate is not a self-limiting coagulant when applied to the hard structure of the tooth.

Similar experiments upon the penetrative power of carbolic acid are still in progress, and though they are not sufficiently completed to form the basis of a report, there is enough evidence to show that this substance follows the general laws of osmosis as do the other crystallizable coagulant antiseptics though the rate of penetration is much slower.

The Dental Cosmos.

Reports of Societies.

STUDENTS' SOCIETY.
NATIONAL DENTAL HOSPITAL,

The usual monthly meeting of this Society was held on Friday, April 6th, C. W. Glassington, Esq., President, in the chair.

The minutes of the previous meeting were read by the Hon. Sec., and confirmed, and the President gave the usual welcome to the visitors present.

CASUAL COMMUNICATIONS.

Mr. BURROUGHS reported a case of Epithelioma of the Antrum in a man æt. 46. The patient had only noticed it since November, 1893, and when he came to the hospital in March, 1894, the growth involved the hard palate, lips, and cheeks, upon which it showed signs of fungating. There was extensive enlargement of the maxillary glands, rendering the case beyond the hope of any operative interference. The case is of interest as its starting point seems to have been due to the irritation produced by a carious canine.

Mr. Burroughs also reported a case of epulis between the left lower lateral and canine in a woman, æt. 52. The treatment consisted of removing the growth with a scalpel and then searing the part with a Paquelin's cautery. The patient was seen six weeks after, and appeared to have made a very good recovery.

Mr. GLASSINGTON said that he operated on the patient, and although in this case he did not extract the teeth, yet he thought in most cases it was advisable to go in for the radical treatment. He thought that this was a case which would be very satisfactory, but of course six weeks was not long enough in which to see if there was any recurrence of the growth.

Mr. Glassington said a patient came to him about twelve months ago with the two centrals and canines standing in the upper jaw, and also two right bicuspid stumps. Around the latter there was a hard swelling, so he extracted the roots, and as he did not like the look of the case, told the patient to call in a month's time. The patient returned, but the swelling had not disappeared, so he called in a consulting surgeon, who said that it was only an inflammatory condition of the bone; but although Mr. Glassington thought differently, still it is always best, when one has any undecided opinion in a case of this kind, to consult someone of higher authority.

Mr. J. W. Smith showed a radicular odontome from the region of the superior lateral incisor, that he had removed from a girl, aged 18. There was no pain, but owing to the protrusion of the gum, it was of unsightly appearance. Mr. Smith presented it to the museum.

Combination Fillings

Mr. Humby then gave a practical demonstration of a Combination Filling in the mesial cavity of an upper six-year-old molar. The roots having been filled on a previous occasion, the rubber dam was applied, and the cavity first lined all over with Harvard cement, then while soft a small quantity of submarine amalgam was pressed into it.

A very thin electro-plated german silver matrix was roughly bent up to suit the cavity, being held in position by the rubber dam clamp, and a triangular wedge of wood between the teeth. More amalgam was then carefully packed with a fine pointed plugger on to that already held in position by the cement, and gradually built up until the cavity was nearly filled, pressing it well over the cervical margin, and building it up as much as possible where it was hidden by the next tooth, and would not therefore be noticeable when finished.

A small starting point was then made in the amalgam with a fine pointed plugger, and filled with gold, and starting from this the surface of the amalgam was covered with cylinders, flattening each one carefully on to the amalgam, and not allowing it to crumple up.

The small excess of mercury squeezed out by the pressure naturally amalgamated with the first layer, thus ensuring a firm hold, the remainder of the gold was then malleted in, and finished in the usual way.

The filling when completed had the appearance of being entirely built up of gold, and the operator felt sure that whoever experimented with this method, would besides being satisfied that the cervical edge was perfectly solid, be fully compensated by the saving of time, labour, and material.

A very hearty vote of thanks was accorded to Mr. Humby for his demonstration, and the meeting then adjourned.

MANCHESTER ODONTOLOGICAL SOCIETY.

The usual monthly meeting of the Society was held at the Grand Hotel, Aytoun Street, on Tuesday evening, April 3rd, The President, Mr. T. Murphy, in the chair.

CASUAL COMMUNICATIONS.

Mr. **SIMMS** showed models illustrating the mechanical treatment of the case of a twisted upper incisor, and also a model of the upper maxilla of a girl 13 years of age, which showed the presence of a left lateral supernumary incisor, and also an enamel-covered notch at the distal angle of the left central incisor.

Mr. D. **HEADRIDGE** showed a pair of lower forceps specially made to his own design.

Mr. H. T. **DRESCHFELD** showed a lower molar extracted from a child six years of age, in one of the roots of which was found a piece of wire.

THE DEMONSTRATIONS ON BUTTNER CROWNS AND CRYSTAL MAT GOLD FILLING.

The discussion on these demonstrations, performed at the last meeting was introduced as follows by W. **DOUGAN**, L.D.S. —Before making any remarks upon the recent demonstrations, I would like personally to thank the two operators for their admirable specimens of gold filling and tooth crowning. The importance of these operations is greater than formerly. The time was when dentists even in high-class practice looked to mechanical work to provide the bulk of their income. This is no longer the case, and I suppose that at the present time most dentists derive two-thirds of their income from filling and crowning teeth. The importance of these demonstrations of tooth crowning cannot well be over estimated, as the demand for this kind of work is rapidly increasing, and the dentist who wishes to march with the times must be proficient in the best ways of doing this work. The Büttner system which Mr. Renshaw demonstrated is what you might call an automatic method of fitting and fixing, and as such is worthy of much attention. My main objection to it is that there is a ledge left in the root which might be a cause of periosteal irritation, and I shall be glad to hear the opinions of those members who have used this crown largely as to whether any trouble does arise from this cause. Mr. Masters tells me that with a view of preventing any trouble he has chambered away the edges of the ledge, and this seems to be very desirable. With regard to Mr. Minshall's admirable demonstration of White's Crystal Mat Gold for filling teeth, I can say but little. Many of you may have noticed Mr. Minshall's engine mallet. It was one of the old-fashioned Buckingham Mallets, and although but little used nowadays, it has some admirable points about it. The blow given is absolutely regular and certain whether the engine is running fast or slow; whatever blow it is set to give it will give. This is also true of several other mallets in the market, notably the Power mallet. It seems to me that machine mallets are not sufficiently used or appreciated. There can be no doubt that gold can be solidified much faster with them than by other means, always provided that pellets or strips of gold of the same thickness be used. It is, of course, possible to use large bulky pieces of gold, and condense them rapidly with a hand or automatic mallet, but I contend that the resulting filling will not be so perfect as when light rapid blows and smaller pieces of gold are used. One point I would like Mr. Minshall to inform me about. Does he consider that this new gold produces a harder and better wearing surface than foil, and is easier to manipulate, and generally what are its advantages or otherwise.

Mr. Collett said that since he had seen Mr. Minshall's experiment with the mat gold he had been using it somewhat extensively, by way of experiment. He had found it very easy to work with in crown cavities. Of course time alone would test its wearing qualities. It presented a very hard surface, and in cutting down and polishing with the bur, he thought it was even harder than foil gold. The edges seemed perfect. More experience would be necessary before one could use it for contour fillings.

Mr. Simms said that in interstitial cavities the crystal mat gold was far inferior to foil. The chief point to him in Mr. Renshaw's demonstration was the fact that he was able to get his gold crown sufficiently high above the gum, and thereby effectually conceal the junction of the tooth with the gold crown. He believed that for holding on and doing good work, the crown was the most perfect for the front teeth. He noticed Mr. Renshaw used long pins, whilst he (Mr. Simms), used short pins. In the case of fracture of the mineral tooth, it was difficult enough to get the crown off with a short pin, and that difficulty was greatly increased with a long pin. He had rarely known a crown give with a short pin. The best way of obtaining an impression in these cases was by means of plaster of paris, with the gold crown in position, for by such a method the exact reproduction of the different parts could be secured with absolute accuracy.

Mr. P. Headridge said that with respect to the Büttner crown he thought it was a very excellent idea, but as one of the speakers had said, it was rather automatic, and he thought more ought to be left to the ingenuity of the operator. Where the root was straight, and they could get the pin in perpendicularly, there was no doubt that it was of advantage, but where the root was slanting it could not be used. Again, he thought the cap which was made to fit round the tooth might be made thinner, thereby necessitating less of the natural tooth being cut away. He did not see the need for taking an impression when they had already got the cap fitted. With respect to mat gold, he remembered that there was a similar gold in use twenty-five years ago. He himself used it but discarded it then because of its tendency to powder if kept too long. Watts' gold being of a spongy nature, was generally used in the old days to fill up the gaps that were caused in the filling by the use of the hand pluggers. Now that the mallet was used its employment was unnecessary. He had used Watts' gold, but in contour work it was rather brittle, and he should say that mat gold was very similar. It was right enough where they had crown cavities with a good wall all round, but in other cavities he should be very much inclined to doubt its value.

The President said he intended to give a trial to the crystal mat gold. With regard to Mr. Renshaw's demonstration, he did not agree with Mr. Headridge as to the uselessness of taking an impression; that was, to his mind, the only way in which the work could be done accurately. He, himself, did not use the short pins, but shortened the long pins, and thus had a pin of intermediate length. To his mind Büttner's system of crowning seemed mathematically correct.

Mr. Minshall, in reply, said he was scarcely competent to answer Mr. Dougan's query as to the hardness of the surface produced by the mat gold. He had only once, prior to the evening of the demonstration used the mat gold for a complete filling, although he had frequently used it for the construction of a portion of a filling. He inserted it in a large crown cavity as an experiment some three years ago, and although he had examined it on many occasions since it was still as good as the day it was put in. He was rather inclined to differ from Mr. Collett in his belief that the mat gold formed a harder surface than the foil gold, nor did he agree with the assertion that it was difficult of insertion in interstitial cavities. His experience was that in such cases it was as useful as any other form of gold. He had certainly obtained better results with the mat gold than with Watts' or Steuer's gold.

"Pyorrhœa Alveolaris," by Mr. G. N. Skipp, printed on page 442.

Discussion.

Mr David Headridge said that there were several diseases affecting the periodental membrane which were sometimes confounded with Pyorrhœa Alveolaris. He himself believed there was a distinct disease which should be classified under this head, but he should like a clear definition as to what the disease was. He noticed in Mr. Skipp's paper the observation "sub-acute type." Did that mean a type of inflammation affecting only the mucous, and not the periodental membrane--indicated by an increased vascular condition of the gums, which were smooth and swollen, and the mucous membrane surrounding the neck of the tooth detached and rounded to the socket of the tooth, and of the same light maroon shade as the surrounding tissue. This condition he did not think was to be associated with Pyorrhœa Alveolaris, as there was no appreciable discharge from the tooth socket, which was so characteristic in that disease. And as a matter of fact in Pyorrhœa Alveolaris there was not this increased vascular condition, but an inflammation accompanied by an excessive purulent secretion, oozing from deep pockets round the necks of one or two teeth, the gums being of a normal colour almost up to the edge of the sockets. Although he (Mr. D. Headridge) had used most of the drugs which had been from time to time recommended, and should certainly give ethylate of sodium a trial, he pinned his faith to chloride of zinc. In cases beyond successful medical treatment, the loose teeth might be ligatured together by thin gold wire, and so retained for a long time.

Mr. H. T. Dreschfeld said that Pyorrhœa Alveolaris was a disease that he was very much interested in just at present, inasmuch as he had two cases under his observation which were not going on as favourably as he could wish. In the first case he was trying the treatment recommended by Rigg, namely, scarifying the bone beneath the tooth, and using sulphuric acid. The good effect, however, only lasted about a week, and the discharge then began again. In the second case, after previously wiring the teeth together, the patient was put under chloroform, and as much of the alveolar process was cut away from beneath the gum as possible. That case seemed to be going on better. He thought a great number of cases were described as Pyorrhœa Alveolaris which were really not so. Only when pus was present did the disease come under this name.

Mr. PLANCK: Perhaps some one will tell us the exact meaning of the word Pyorrhœa?

Mr. DRESCHFELD: Pyorrhœa means an "oozing out."

Mr. SKIPP: I think it is rather a waste of time to discuss the derivation of a word.

Mr. W. A. HOOTON said he did not think it was a waste of time to be exact about definitions, and there was anything but unanimity as to the class of cases to be included. He took this position, and he had advanced it before, that Pyorrhœa Alveolaris, taking its literal meaning of an oozing of pus from the sockets of the teeth, was a symptom and not a disease at all. It was a symptom which might arise in the course of different diseases. They might get it as the result of the deposition of tartar on the teeth. In that case, he supposed Mr. Skipp would eliminate all those cases from those which he had been discussing that night. Mr. Skipp would perhaps apply it only to the more severe forms. In a typical case they had "pockets" extending up along the teeth, and not running round the teeth. He agreed with Mr. Skipp that the severer forms of this disease were constitutional, and not local. This was also the view of Mr. Bland Sutton. As regards treatment, he thought the sulphate of copper was useful. One objection to the use of chloride of zinc was, that its application was very painful. He himself should certainly try one of the other stimulating applications recommended by Mr. Skipp, namely, a mixture of Tinct. Pyrethri and Tinct. Capsici.

The PRESIDENT said he quite agreed with Mr. Hooton and Mr. Skipp, that in nineteen cases out of twenty the symptoms they noticed were merely secondary. The disease seemed to proceed from something in the system, and until they removed the cause little good could be done. Local treatment seemed to be of little value, the disease always seemed, even if apparently cured, to return in a few years. One difficulty they had to contend with, was when a patient got a little better he stayed until he was compelled to again seek their aid, through the recurrence of the worst symptoms of the disease.

Mr. Skipp, in reply, said it was quite true that Pyorrhœa Alveolaris was the result of a constitutional condition, and some patients seemed much more liable to it than others. He believed, however, that if they could only get the patient in hand soon enough, that by using the ethylate of sodium the disease could be arrested until some other irritating cause brought it on again.

The President thanked Mr. Skipp on behalf of the Society for his interesting paper, and the proceedings then terminated.

Dental News.

£150 DAMAGES AGAINST Mr. H. JAMES PARKINSON, OF MANCHESTER.

At the Liverpool Assizes, St. Georges' Hall, on the 4th May, before Mr. Justice Wills and a special jury.

Margaret O'Toole, a servant, sued James H. Parkinson, dentist, Manchester and Liverpool, to recover damages for personal injuries caused by the pulling out of all her teeth without her consent having been first obtained.

Plaintiff was represented by Mr. Horridge, and the defendant by Dr. O'Feely.

Mr. Horridge in opening for the plaintiff, said that Miss O'Toole was twenty years of age, in service at West Kirby. On the 24th January last, she went to the surgery of the defendant, and saw Mr. Harrison, the manager. She told him that she had come to have a back tooth extracted. On examining her mouth Mr. Harrison said "Yes, it is very badly decayed, and there are two or three other teeth in your head badly decayed, and you had better have them out as well." Evidence would be given, counsel added, that the teeth were, with one or two exceptions, sound and good. Eventually patient was put under chloroform, and the whole of her teeth were extracted. There was no medical man present when chloroform was administered.

Plaintiff, cross-examined by Dr. O'Feely, said that about a year ago she had a tooth removed in Manchester, but it was not very much decayed. When living at West Kirby she had toothache for a long time, and went to Mr. Parkinson's place in Liverpool in consequence of an advertisement. It was not correct that she told Miss Parkinson that she wanted three or four teeth out, or that she was going to have all her teeth removed. She was some time in the retiring room, and when she came round Miss Parkinson said, "Well, they are all gone now; you will not have any more toothache." Mr. Harrison did not tell her that the whole of her teeth were decayed, and he did not say that the best thing would be to have them removed. He did say that if she kept the three or four teeth in they would cause the others to decay. Then she consented to have those teeth out, but did not leave the matter as to the whole of the teeth in the hands of Mr. Harrison.

Evidence was given by Esther O'Toole, elder sister of the plaintiff; Mrs. Thornton, her aunt; Mr. and Mrs. Greatrex, her employers; and Mrs. Butterworth, a friend; as to the soundness of the plaintiff's teeth immediately prior to their extraction.

Mr. William Matthews, dentist, Rodney Street, Liverpool, said that in dental practice, chloroform was not administered without a medical man present. Once only in his experience had he found it necessary to draw all the teeth from a girl of the age of the plaintiff. On the 20th March witness examined the plaintiff's mouth, and there were indications that only one tooth had been seriously decayed to such an extent that it could not easily have been saved.

Dr. O'Feeley, in opening the case for the defendant said Mr. Parkinson was at present seriously ill. It was not likely that he would appoint to the management of the Liverpool business a man who had not the necessary qualifications, and Mr. Harrison had had about twelve years' experience in the business of a dentist, of which the last six were in the operative department of this important science. The questions to go to the jury were, was this operation performed by the consent of the plaintiff; and if the matter had been left to his judgment and discretion, then did he exercise reasonable, ordinary, and competent skill in doing it. There seemed to be no question as to the skilful manner in which the operation was performed, and he (Dr. O'Feeley) contended that it was performed with the full consent of the plaintiff.

Ernest Harrison, defendant's manager, was then called. He had, he said, nearly eleven years' practice in dentistry, and had been through a regular course of instruction. He had been six years in the operating room, and many thousands of patients had during that time passed through his hands. He remembered the plaintiff coming to the surgery on the 24th of January last. She said that she had come to have two or three, or three or four teeth removed, as she seemed to "have toothache all over her face." Witness told her that she had not a sound tooth in her mouth, and that all of them were decayed. He also asked her if she was thinking of having some artificial teeth made, and she said "soon." Witness told her that it would not cost her anything for the extraction if she had a set of teeth, the charge being four guineas. She said that would be the best course to take, and asked witness to extract her teeth. It was a safe and proper course to remove the teeth. In reply to questions, witness said that he used the stethoscope to see that there was no disease of the heart. He had had special training with regard to diseases of the heart. Witness, cross-examined by Mr. Horridge, admitted that he was not a fully-qualified dentist, but he was registered as a medical student and awaiting his "exam." He had heard of one or two actions brought by dental patients against Mr. Parkinson. He could not now recollect whether he used ether or chloroform. He might have extracted as many as twenty teeth from the plaintiff, and the operation occupied four or five minutes. After patient recovered she said that she was glad that she had had all her teeth out, as she would have no more toothache. About a week later plaintiff called to see if her mouth was nearly ready to have the cast for the artificial set, and she paid a deposit of 8s.

Miss Parkinson, daughter of the defendant, and Miss Donnelly were called to prove that in conversation with the plaintiff she admitted that she was glad she had had all her teeth out. She never suggested to them that Mr. Harrison had done this without her consent.

Dr. Hugh Alex. Clarke said he had recommended patients to go to Mr. Harrison, who was a skilful operator. If the girl's teeth were decayed it was a wise and prudent course for Mr. Harrison to extract them.

To Mr. Horridge.—In the absence of a medical man and of any relatives he would not have been disposed to administer chloroform to the plaintiff.

His lordship in his summing up, said that it was fair comment for Mr. Horridge to insinuate that the defendant's advertisement "Teeth, teeth, teeth" was at the back of the case. A girl who was on the threshold of life was condemned to wearing a mouthful of artificial teeth for the rest of her days, and if that had been the result of circumstances which could reasonably have been obviated a very cruel wrong had been done to the girl. If the jury chose to give the plaintiff compensation they must bear in mind that certain expense would be entailed in providing false teeth. For his own part he hoped to goodness that she would not go in for a four guinea set, but engage someone who would supply a proper set.

The jury found for the plaintiff, damages £150.

APPOINTMENT.

Mr. H. G. Ashby, L.D.S. Eng., has been appointed House Surgeon to the Victoria Dental Hospital, Manchester.

There are a variety of styptics and hæmostatics recommended for the alleviation of hæmorrhage, but our personal experience has been that there is none better than alumen pulv. in combination with some astringent tincture. We consider it superior to the ferri perchlor., for the reason that in nearly every case it accomplishes the desired end, and there is no danger of a slough. In short, it possesses all the good qualities of the iron, without any of its bad ones. Of course we do not mean to say that the tinctures of iron should never be used, for there are cases in which they may be employed very advantageously, but we would use them in the capacity of styptics as a last resort.—W. Bell, L.D.S.

Dental Hospital Reports.

WORK DONE at the Victoria Dental Hospital of Manchester during the month of April, 1894.

Number of Patients attended .	866
Number of Extractions . .	1076
Number of Extractions under Anæsthetics .	175
Gold Stoppings . . .	148
Other Stoppings . . .	150
Miscellaneous {advice, temporary fillings, scalings, dressings, &c. . .	28
Crowns	92
Irregularities. . . .	18
Total . . .	1553

HERBERT G. ASHBY, *House Dental Surgeon.*

To Correspondents.

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2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.

3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.

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British Journal of Dental Science.

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THE RELATION BETWEEN AFFECTIONS OF THE TEETH AND OF THE EYES.

By Dr. N. Feuer, (of Budapest).

Translated by Sydney Stephenson, M.B., Surgeon to the Ophthalmic School, Hanwell, W.

(*Continued from page* 441.)

Before going further into the description of reflex eye disorders, we may, however, simplify the subject by dividing it into two sub-groups, viz. :—(1) Inflammatory affections, and (2) functional derangements.

(1) Inflammatory Affections :

That neuralgia of the trigeminus may produce photophobia, blepharospasmus, hyperæmia, and even considerable swelling of the conjunctiva, is a fact very generally known. It can scarcely be considered as remarkable, therefore, that toothache, also, may induce a similar train of reflex events. In many published cases, indeed, where descriptions have been given of chronic or relapsing "inflammations of the eye," bad sight, and the like, which disappeared after extraction of teeth, it is probable that this sequence of symptoms was the subject of description. The association is as natural as it is unimportant; unimportant for obvious reasons, natural because a more or less common nervous and vascular supply is present. For the rest, attention must be drawn to the anastomosis that exists between the nervus lacrymalis and the ramus temporalis of the nervus orbitalis (from the second branch of the 5th cranial nerve), and also to the fact that the first branch of the 5th cranial nerve (supplying the skin over the temple and the forehead, and certainly the cornea as well) is often more sensitive in toothache, by reason of which augmented lacrymation, dread of light, and more or less blepharospasmus may be excited (compare Hutchinson's first case and my own given later on). The active hyperæmia together with the irritating action of the tears will, it is easy to understand, combine to produce swelling of the conjunctiva, and thereby give rise to an appearance as of inflammation of the membrane.

Catarrh of the mucous membrane of the respiratory and digestive tracts is often noticed during the period of dentition. Under these circumstances, it is not astonishing that a true catarrh of the conjunctiva, with great swelling of the lids and copious secretion, is sometimes met with.

Furthermore, in children predisposed to phlyctenular affections of the eye, every irritation, which would in others produce a simple conjunctivitis only, entails the formation of herpetic efflorescences. Again, as a consequence of dental irritation, the symptoms of an already existing phlyctenular conjunctivitis may be rendered more obstinate. But all this however, is a totally different thing from claiming that every phlyctenular inflammation of the conjunctiva may be traced to a dental cause. For that matter, thousands of such cases are treated successfully every year in ophthalmic clinics and elsewhere without the slightest attention being bestowed upon either the gums or the teeth.*

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*In the matter of phtyctenular disorders it may be of some little interest to quote the opinion of Mr. Jonathan Hutchinson, who nearly thirty years ago wrote as follows: "In many of the cases of so-called "strumous ophthalmia"

Granted that dental irritation may give rise to certain appearances in the conjunctiva, yet that admission does not involve a belief in the reality of such irritation causing purulent or interstitial keratitis, retinitis, or inflammation of the uveal tract or of the optic nerve. The teachings of modern pathology lend no support to the view that nerve irritation or nerve palsy can produce actual inflammation.

The trophic theory has lost its glory-cloud since pneumonia after section of the vagi has been recognised as traumatic in its origin, and the keratitis following division of the fifth cranial nerve as due to dessication of the cornea, in consequence of abolition of reflex winking.[33] The only instance of disturbance of nutrition from nerve irritation is that of Herpes Zoster, concerning which Cohnheim has observed that we shall do well to await further anatomical and experimental evidence before we base far-reaching conclusions on this isolated fact. On the other side, nobody has witnessed the hyperæmia resulting from section of the sympathetic pass over into inflammation (Mauthner). It is a striking fact, moreover, that in spite of several weeks duration, neuralgia of the supra-orbital nerve (which is more closely related to the eye than either the second or the third branches of the trigeminus) does not cause inflammatory affections of the globe, although lacrymation, photophobia, and hyperæmia of the conjunctiva are present during the attacks of pain, which commonly go on through the greater part of each day. It is also significant that, of all the recorded cases of dental reflex, there is hardly one that suffered from severe toothache; on

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in young children, in which small ulcers on the surface of the cornea, or near its edge are attended by great intolerance of light, lachrymation and pain, the use of the gum-lancet at once relieves the more urgent symptoms."—*Royal London Ophthalmic Hospital Reports*, Vol. iv., p. 383). Trans.

[33] Feuer. Untersuchungen uber die Ursache der keratitis nach Trigeminus dusch schneidung. (Sitzungsber d. kais Akod d. Wissensch. in Wien, lxxiv., Bd. 3, Abth., 1876. Compare also E. v. Hippel: Zur Aetiol. d. kerat. neuro. paralytica in Graefe's Arch. f. Ophth. xxxv. 3, 1890.

the contrary, carious teeth or roots, which caused the patient little or no annoyance, were almost invariably the subjects of surgical interference.

By Power and other authors, however, reflex eye affections are represented as analogous with sympathetic ophthalmia. But ophthalmologists have altogether abandoned the idea that the latter disease is the result of a simple reflex proceeding from the affected eye. The process is at present regarded, on the evidence afforded by anatomical research, as creeping from one eye to the other by continuity of nervous structure; indeed, facts indicating its mycotic origin have been recorded by Deutschmann. Galezowsky's supposition of an "ascending neuritis" has not been demonstrated anatomically, and is therefore improbable. Besides having to pass a long way over the Gasserian ganglion, such neuritis would produce derangement of nutrition in the eye, as well as in the other regions of innervation, and eventually in the skin of the face. In fine, existing observations are not of such a kind as to warrant, in more than a small degree, a belief that keratitis and the like may be produced by dental irritation.

We may now pass forward to describe other affections, taking up the various disorders seriatim.

CORNEA.

Despite its striking and suggestive title, *Rupture de la Cornee par suite de L'Extraction d'une dent*, Duval's case [35] can scarcely claim a place in this section. The clumsy extraction of a right upper molar was followed by fracture of the superior maxilla and damage to the trigeminus among other nerves. The eyes at once deviated from their normal axes; sight was lost; and taste and sensation in the tongue, as well as hearing, were abolished. Next day, sight returned

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34. Mauthner. Die Sympath. Augenleiden, 1879, p. 54.

35. Duval. Annal. d'Oculist, 1846.

to the left eye, but the right eye remained blind. On the same evening, the right cornea was noticed to be cloudy, and, notwithstanding treatment, it burst at the end of eight days from Neuro-paralytic Keratitis, which had pursued its usual rapid course. Manifestly, it would be an unwarrantable proceeding to speak of the foregoing case as an instance of a corneal affection due to disease of the teeth.

In Power's case [32] also, a Keratitis Neuro-paralytica seems to have been present, since the cornea and the whole region supplied by the ophthalmic branch of the trigeminus were insensitive. It is true that after the extraction of several teeth, a transient improvement set in; but the case terminated, some seven months later, in loss of sight and the eye was eventually enucleated (compare Collins.)[22]

With regard to the cases recorded by Keyser,[36] Galezowsky[37], Hern[38], Brunshvig[39], Albert and Colyer (see Collins[22]), we may make the following remarks. Two points should make us careful before we place ulcerative keratitis and affections of the teeth in causal relation. First, the fact that the etiology of corneal ulceration is often most obscure, although the disease, it is true, heals, under ordinary symptomatic treatment, none the less readily on that account; secondly, that the great majority of people have something or other the matter with their teeth. Diseased teeth might be extracted from a patient whose corneal ulcers were already healing, but obviously in such a case the improvement could not be set down to the dental operation. On the other hand, it seems quite impossible that purulent keratitis whose regression is not yet prepared by the formation of vessels, could at once be cured by a dental operation, which would be necessary to prove a *nexus causalis* between the two matters.

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[36] Keyser. The Dental Times, October, 1870, E. Virchow.Hirsch's Jahresbericht, 1872, Bd. ii., p. 575.

[37] Galezowsky. Journ. et Recueil d' ophth., 1872, p. 111 and 606, 1874, p. 215 and 363, L'Art Dentaire, 1876, (compare Deutsche Viertell cherschrift fur Zahnheilk, 1876, p. 467) and Progres Med., 1886 (Mai 22) and 1888 (Nr. 29).

[38] Hern. British Medical Journal, Sept. 28, 1889.

[39] Brunshvig. Rec. d'ophth. Juillet, 1887.

Power (loco citato) himself brings into prominence the question as to how far dental irritation is capable of producing affections of the eye, and admits that the point is a knotty point to solve. By reason of the extraordinary frequency of dental trouble, scarcely anybody can be found—let him have eye disease or not—who possesses altogether sound teeth.

Toothache, as everybody knows, may induce irritability and sleepless nights; in a word, it is capable of depressing the vital powers to a considerable extent. This factor must not be lost sight of in suggestive cases; it possibly predisposes to corneal ulcer and hypopyon.

IRIDO-CHOROIDITIS.

Galezowsky (l. c. 1873, p. 227), cites a case of irido-choroiditis, his explanation of which is open to considerable question. A woman, 28 years of age, experienced, fourteen days after the extraction of three molars, violent headache, inflammation of the left eye, and complete loss of sight. Two years later (1873), she consulted Galezowsky, who found the left eye reddened, tender, and disposed to atrophy. As regards the right eye, sympathetic disease was present, as shown by immobility of the pupil, opacities in the vitreous humour, and diminished tension. Notwithstanding the removal of some diseased teeth, sight steadily failed. Later, iridectomy was performed, an operation which succeeded in preserving a certain amount of vision.

Concerning this case we may remark that the affection which eventually induced phthisis bulbi and irido-choroiditis declared itself fourteen days after the dental operation. It appears, therefore, to have been independent of that procedure. Further, the toothache (for the relief of which the teeth were extracted) was probably a consequence rather than a cause of the irido-choroiditis and due to the diffusion of the ciliary pains (see end of this section). To be brief, Galezowsky's case by no means proves that the eye disease was a direct consequence of a reflex taking origin from the extraction wound. Indeed, the venous connection, described before as existing between the oral cavity and the orbit, might be taxed to explain such an occurrence in a much more natural way. Leaving aside retro-bulbar inflammation as a possible cause, such venous connection could certainly have furnished the connecting link between the two affections; or the irido-choroiditis, it is conceivable, might have resulted from the lodgment of an embolus directly in the eye. In the latter connection the following case described by Dimmer[40] is well worth notice.

Pain in a carious tooth lying in the left half of the inferior maxilla; after three unsuccessful attempts, the tooth was extracted. Two days later, these symptoms were observed: marked swelling of the gum and of the left cheek, which were painful; difficulty in swallowing; and pains in the neck. A fortnight after extraction of the tooth, rigors, recurring several times daily, set in. At the same time, the patient, thirteen years of age, noticed that the right eye saw as through a veil. Next day, the sight had quite gone; proptosis was present; and the lids were red and swollen. Pus then broke through the sclera, and the eyeball commenced to shrink (*phthisis bulbi*). When Dimmer first saw the case, panophthalmitis was already subsiding, and he rightly identified the cause as of metastatic nature (pyæmia proceeding from the extraction-wound).

Faucheron[41] and Brunshvig (*loco citato*) report a case of iritis, which resulted in rapid cure after removal of a diseased tooth. That, however, is scarcely sufficient evidence to show that the iritis depended upon the dental affection. We must bear in mind, moreover, that the pathogeny of inflammation of the iris, as of corneal ulcer, is often most obscure.

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[40] Dimmer. Wiener Med. Wochenschr., 1883, Nr. 9.

[41] Faucheron. Rec. d'ophth., 1881, p. 145.

Finally, Brunshvig relates the case of a man, 66 years of age, whose eye, blind from infancy, became affected with suppurative choroiditis. After the removal of three painful stumps, the disease greatly improved in one night.

GLAUCOMA.

Mooren, in his monograph upon the treatment of glaucoma (1881, p. 12), writes : " There are a large number of observations in which the continual irritation of a dental branch of the trigeminus led to the development of glaucoma." It is well known that Hippel and Grunhagen observed heightening of the intraocular pressure as the result of stimulation of the fifth cranial nerve ; and Mooren's statement is evidently founded upon the theory which assumes that glaucoma is due to hypersecretion, a view that in former times counted many adherents. Other authors, beside Mooren, have noted the association of glaucoma with toothache. Priestley Smith[42], and Creniceanu[43], think that, when the anatomical conditions necessary for the production of glaucoma are already present in an eye, then a violent odontalgia, together with its accompanying depression of mind, may give impetus to the actual attack. The glaucoma which often appears in an eye, when its fellow has been operated upon for that disease, may be explained in a similar way. The patient, confined to bed with bandaged eyes, becomes depressed, and consequently, an acute attack is excited in the second eye.

Creniceanu (*loco citato*) describes a case of glaucoma associated with toothache. After the performance of iridectomy, exacerbations of the pain took place. At first sight he inclined to the belief that the two affections were related, but careful enquiry convinced him that premonitory symptoms of glaucoma had been present for three years, during which period no dental trouble was noticed. Thus, the sight had failed, while haloes around lamp flames had been observed, and iridectomy had been proposed to the patient, but refused by him.

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[42] Priestley Smith. Glaucoma, London, 1879.

[43] Creniceanu. Szemézzet, 1885, Nr. 5; Klin. Monatshl. fur Augenheilkunde, 1886, p. 310, and Arköry's Diagnostik der Zahnkrankh, 1885, p. 349, u.s.f.

In a certain sense, this communication recalls Dimmer's case of Irido-choroiditis, already described in the foregoing pages. In both, careful investigation of the history alone preserved the authors from assigning the ocular affection to a dental cause ; both show, moreover, how easily a false conclusion may be arrived at when the history (which depends to a large extent upon the intelligence and accuracy of the patient) leaves any loophole for error.

After all in regard to this matter we have to deal, not so much with theoretical questions, but rather with the practical treatment of glaucoma, a malady that calls for such serious and immediate attention. Power[32] had a patient, a lady 32 years of age, both of whose eyes were operated upon for glaucoma, but without success. Two years before the onset of disease in the left eye, she had suffered severely from toothache, which was relieved by extraction of teeth. Power conceived the idea that, instead of performing iridectomy, it might be advisable in similar cases to have every tooth

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*It is a familiar observation that a patient confined to his room after the performance of unilateral iridectomy for glaucoma is apt to develop that malady in the second eye. The explanation usually advanced is that the pupil of the eye which has not been operated on becomes dilated in consequence of the surrounding darkness. Given a narrowed filtration-angle, such dilation of the pupil would be likely to precipitate an attack of glaucoma. The fact is widely known that all mydriatics, for example atropine, cocaine, and homatropine may bring about a similar result in predisposed eyes.—*Trans.*

carefully and thoroughly examined by an experienced dental surgeon. "I would ask," he writes, later on, "whether such a case is not adapted for the removal and replantation of teeth, if these, after extraction, were found to be sound."

Redard's[44] case alone might be regarded as a fairly definite one. Its facts are as follows:—A woman of 28 suffered from glaucoma of the right eye, marked by considerable increase of tension. The left eye was normal. The patient, who was in excellent health, made no complaint of pain. The cause of the monolateral glaucoma was quite obscure. (Now remark what follows). Dr. Abadie performed sclerotomy twice, but with transient success only. Then the teeth were examined, and a very painful stump found upon the right side, the removal of which was followed by an immediate reduction in the tension of the eyeball. The report omits to state whether the fresh scleral wound was not reopened by the extraction, nor does it tell us whether the tension remained permanently low.

In contradistinction to the foregoing case, Javal[45] stated at the conference of the French Ophthalmological Society that he had witnessed the disappearance of previously existing odontalgia after an operation for glaucoma. This was obviously an example of ocular pain radiating to the teeth; and a similar explanation probably applies to many other instances in which it has been claimed that dental pain has given rise to glaucoma.

In the discussion that followed the reading of Collins'[22] paper, Morton Smale cautioned his hearers against coming to a hasty and premature decision.

Redner treated a patient with glaucoma, and thought that the origin of the disease lay in the irritation set up by several stumps. The latter were extracted, but, although a slight improvement was observed, it was of transient character only, and the disease became progressively worse. In a similar case, despite careful treatment directed to the teeth the eyes failed to improve.

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[44] Redard. Gaz. Med. de Paris, 1886, p. 229.

[45] Javal. Congrès Médical, 22 Mai, 1886.

(*To be continued.*)

FRACTURES OF THE LOWER JAW.*

By Mr. C. Fox.

A student writing a treatise on any of the subjects connected with the profession he is commencing is like the newly-fledged traveller just landed in a foreign country for the first time; sitting down to compile a complete history of the manners, customs, and characteristics of the natives, with reflections on the said foreign State and Government, past, present, and future. And though the Polytechnic globe-trotter does prematurely rush into print, and the budding scientist dash into the fray regardless of the intricacies of the region in which he is engaged, I have decided to play a cautious game. No single practitioner unless he has lived in an exceedingly brittle or rowdy neighbourhood can boast of many cases of fracture of the lower jaw; and having had the good fortune to see, note, and handle, three cases myself, during a preliminary canter at our local Gloucester Infirmary, I can approach the subject with some degree of confidence.

As a rule that clause "two years' general hospital practice" inscribed on the schedule of our studies is an utter and complete farce. Contrast it for a moment with the two years' dental hospital practice we do actually go through, and the humbug of the thing is manifest. It might be advisable and possible to compel us for a month or so to attend the out-patient department and wards, and do the bandaging, dressing, stitching, &c., of those regions, but in ninety-nine cases out of a hundred, with L.D.S. students, the clause is merely a matter to be signed up for.

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* Read before the Students' Society, National Dental Hospital.

But as the solitary student chick of our clever and over-worked local house surgeon, I had a pretty thorough drilling in all the daily drudgery of ward and out-patient room, and it was at 8 p.m. one evening, after going our last rounds that a call to the casualty room, introduced me to my first view of a broken mandible.

A policeman, two farmers, and a ghastly burden carried in on a stretcher from a cart outside was our first view. A hasty examination of the case showed us an old man, unconscious apparently, with his head and face roughly bandaged in a dirty and blood-soaked handkerchief. A cross-examination of the witnesses produced the following evidence :—

Victim—John Marks, haulier, age about 65, found on the Highnam Road, an hour before,his empty timber waggon and horses a few yards beyond. Seen to be badly injured about the head. Unable to ask him for particulars, but knew the first cause to be alcoholic, and the direct agent the aforesaid waggon.

When prohibition grows and flourishes, and compensation is flying around, the medicos, along with Boniface, should urge their vested interests, for the "wee drappie," is responsible for a goodly share of their work and wages. As poor John Marks lay prone before us, the words of the old epitaph rang in my ears :—" Here I lie, and no wonder I'm dead ; for the wheel of a waggon ran over my head." But he was not quite *non est*, and a bowl of warm carbolized water, and a gentle application of the sponge gradually revealed the state of things more clearly. A deep cut on either cheek across the body of the mandible shewed where wheel and road had each done its best to meet its fellow. The flesh around the cuts was torn and the bleeding had been considerable. The jaw hung down in a helpless fashion, clearly indicating some fracture and displacement of the parts. As the patient was still partially anæsthetised by drink, a thorough diagnosis was at once undertaken, and we could feel the front portion of the mandible move independently of its normal joint, and hear distinct crepitus on right and left. The tissues were torn inside the mouth, and we could localise two distinct fractures. One across the ramus of the right side just above the wisdom tooth, the other and more complicated looking wound across the body of the left side in the position of the second bicuspid.

The old fellow's teeth were in capital order, those yellow bony-looking members, ground nearly flat on the crowns and sound from central to wisdom. Involuntarily by one's dental training, especially noting the unusual quality of the set, I was able to call the surgeon's attention to one missing in the lower jaw, the second bicuspid just where the fracture was. A probe was brought into action and soon glided over a smooth hard surface down between the broken ends of the bone. We had struck enamel, and before another move was taken, we, with no small difficulty fished up that second bicuspid. By what mechanical action at that crushing moment it had achieved that out-of-the-way location I cannot say, but there it was, and a good thing for the success of our case that we found it early on. For that evening we contented ourselves with getting John Marks between the sheets, and fitting him up with a four-tailed bandage after replacing the jaw as nearly as possible in position. The four-tailed bandage is of course the simplest method of dealing with fractures of the mandible, but is rarely sufficient *per se*. You take a four-inch bandage about a yard long, split each end to within a few inches of the centre, and in that centre piece cut a slit a couple of inches long. The slit is placed over the chin, the lower two ends of bandage tied up over the face and knotted over the coronal suture, the upper ends brought across the cheek and ears, and fastened at the back of the head. Providing the parts are in position this for a time keeps them secure, but before long the bandage stretches, the muscles of the hyoid bone and the digastric unbalanced by the masseter and temporal owing to the fractures, gradually assert their influence and drag down the chin in front. You will always notice the patient on removal of the bandage press his chin upwards with his hand. That is always a sure sign of fracture. When there are external wounds requiring wool dressings of some thickness, the compression of these pads aids in the loosening of the bonds. I murmured something about inter-dental splints, but did not feel sure enough of my ground to argue the matter out there and then, so we left John in a half-drunken, half-sleeping condition for the night. For four days the only change in our method was the addition of an external gutta-percha splint. This is like the four-tailed bandage on a short scale, and is warmed and placed in position and secured with bandages. But every time we came round to re-dress the case, we found him all to pieces again, and the house surgeon was only too glad at last to turn him over to the dentist, and wash his hands of it. And they required washing. By this time, despite a constant syringing with antiseptic washes, permanganate of potash, boracic lotion, &c., the mouth was simply fœtid with pus, and the cheek wounds were beginning to look ugly. So I went at once for my fraternal boss, who ploughed his furrow at Leicester Square some eighteen years ago, and we began our, by no means easy task after the loss of nearly a week. The general practitioner where there is no official dental appointment to a hospital usually undertakes fractures of the jaw unaided. If union of the parts is unduly delayed, he calls in the dentist who is severely handicapped by having to deal with an inflamed state of tissues and loss of time. Or the patient is sent back into civilized society, with a bite half an inch out of gear, and his jaw so much askew that his very wife disowns him.

Taking a correct impression of the teeth under normal conditions is not the simplest process in our profession, and you can hardly realise how extremely difficult it is to take any impression at all under such circumstances as we had in this case. Fractures of the jaw are almost invariably compound, that is the superficial tissues are torn. In both fractured places the mucous membrane of the mouth was badly cut and bruised, besides the wounds inside and outside the buccinator regions. With the softest of wax, and the most gentle of manipulations fair models of upper and lower jaw were obtained, but poor old John, a very plucky fellow, nearly fainted under the process. Casts were taken of these models and the lower presented a gap of $\frac{3}{4}$ of an inch by this time between molar and first bicuspid on the left side, and the plane of the articulating surfaces was considerably altered. The model was sawn across at this space and the pieces fitted to the upper teeth in their normal articulated position. What we should have done with an imperfect set of teeth I cannot say, but we had no doubt here as to the correct bite. After strapping together and putting in an articulator we took stock of the condition of affairs and cogitated. As Mr. Hulke tells us, in diagnosis or in deciding on a course of treatment the safest plan is one by one to eliminate all impossible, and then all improbable theories or methods. So here we were able to strike out of course the four tailed bandage and external splint as feasible and sufficient *modus operandi*, from the trial already given them.

Hammond's wire splint came next on the list as a possible assistance; but with the space we should have to gradually recover between the bicuspid and molar, the fracture behind the right wisdom which would still remain unsteady, and the practical impossibility yet of lacing the splint on to the teeth we had no choice but to set aside that useful method. That most successful case that Mr. T. G. Read recently treated of fracture down the symphysis of the mandible is a good illustration of the capital results attainable with Hammond's splint. The models and splint are here for examination and the result of the case is as satisfactory as anyone could wish, the bite exactly recovered, and the old gentleman looking as pleased and as rosy as healthy appetite and sound apparatus for supplying its demands could desire. In this case the wire splint once laced on, the jaw could be used immediately, the two sides being firmly braced together.

But with the individual to whom I now return not only must the parts of the mandible be held together but the whole jaw placed in one position and kept steadily there until some union at the ramus also took place. His muscles of mastication, masseter, temporal, external and internal pterygoids must have a long vacation, but his gastric economy must not meanwhile be neglected. So I opened the hinge of the articulator sufficiently to leave a quarter of an inch at the wisdom and nearly $\frac{3}{4}$ between incisors, and made a vulcanite splint to fit over the lower teeth, and a deep dentated groove for the uppers to drop in on the superior surface. In front a U-shaped space was filed out that left a hole for John to feed or whistle through. When this was baked and polished up it looked a perfect arrangement in theory. The patient would have the lower teeth capped, the uppers forced into their destined groove and a tight bandage complete the muzzling.

It was not considered advisable to administer an anæsthetic as by this time the whole of the mouth and pharynx were in a very inflamed and swollen condition so great suffering was involved in adjusting the plate and a free use of the graver before it could be even approximately applied to the lower jaw. But at last some approach to the correct position was achieved and the exhausted patient left in peace. Next day I anxiously looked to see results and was delighted to find the teeth had slipped more thoroughly up into their respective niches and owing to the cessation of movement the jaw was less swollen and more comfortable than it had yet been.

Our course of procedure for the next fortnight was continual syringing and swabbing out the mouth, dressing the cheek now nearly healed and seeing that the splint kept in place. By that time John was sufficiently recovered to toddle up to the dental sanctum and well adjusted in the Morrison throne we removed the splint to examine the state of affairs. There was already some union of the parts which we took care not to disturb but easing the splint in a few places and this time wiring it on *a la* Hammond we could soon allow the bandages to be removed during the day time and the mouth to be slightly moved. He was glad to move the temporo-maxillary articulation as the hinge had begun to feel uncommonly stiff, and six weeks later he was able to be finally unmuzzled and the result, considering the difficulties of the case and the delay at the beginning was fairly satisfactory. His bite was not quite as of yore, an eighth of an inch still separated the front teeth. Later on we extracted his lower wisdoms which were receiving an undue share of pressure,and with a little use of the corundum wheel more correctly adjusted the antagonism of the other teeth.

When last I saw friend John he was tackling bread and cheese at a roadside inn where I had stopped one hot summer's day during a bicycle spin for some lemonade, and he seemed to find nothing wrong with the mandibular machinery.

Perhaps the most complicated fractures are associated with gunshot wounds, and have frequently necessitated the removal bit by bit of the bone of the face. One old Crimean veteran ambles round the streets of our "faire citie" with the lower part of the face muffled in a woollen scarf. He left his lower mandible on the heights of Alma, a Russian shell, exploding in his immediate neighbourhood rapidly extracting most of his teeth and a lot of jawbone with them. Without his scarf he is an unsightly object, but on spoon food and 8 shillings a week provided by a grateful country he has existed ever since. Only a little of the ramus of each side remains, the other portion being so comminuted that it had to be picked away in fragments.

We had a slighter case in the wards later on. A kick from a horse had broken off the front alveolar border of a man's lower jaw. The four incisors and a piece of bone containing them were driven into the mouth, but the soft tissues not completely severed. This was replaced and the soft parts stitched together, and a good recovery followed. The rapidity of recovery in wounds inside the mouth is always noticeable even after tooth extraction. The saliva, poisonous when injected into the blood of a rabbit, or even another human being, seems to act beneficially upon the individual. A dog licks his wounds to aid them healing, and probably does assist nature, and the bathing of oral wounds with saliva, is certainly a salutary feature in treating fractures or wounds inside the mouth.

From the little I have seen of fractures, whether in the jaws or other parts, one realises that each case must be dealt with on its own merits. There is no hard and fast rule of procedure. The dentist or surgeon must be ready to invent, adapt or fashion, some contrivance for the occasion, and it is useless to attempt to keep appliances in stock to meet every difficulty. Sometimes nothing but a bandage is necessary. One woman came in, for instance, with her zygomatic process mashed across by the delicate application of her connubial relative's fist, and beyond external lotions and a bandage to rest the jaw, no special method was adopted, and perfect recovery ensued.

In concluding, I would emphatically repeat that fractures of the jaw lie well within the range of a dentist's branch of surgery, and from their daily practice in manipulating these parts, they are better able to cope with them than the average general practitioner. As in the patient vernacular, they so frequently "break my jaw," or "bring away a great piece of bone," with the tooth, surely they should be allowed to do penance and expiate their minor offences, by setting those few jaws that really are smashed to rights. The direction in which the widening of the basis of our speciality should extend, is not so much in a knowledge of general anatomy and medicine, that the M.R.C.S. course gives, as in including within our duties the treatment of oral wounds and diseases, and even throat affections, and specially calling the attention of "dentals" to them in the general wards.

GLYCERO-PHOSPHATES.—At the Academy of Medicine last week, Dr. Albert Robin read a communication concerning the first results obtained by him by means of a new medication which he finds to exercise a specific action on nervous nutrition. The treatment is by glycero-phosphates. By these he hopes to obtain effects at least equal to those produced by the famous Brown-Sequard elixir. Assuming that the qualities of "sequardine" are probably only due to the phosphorus it contains, Dr. Robin has experimented with a preparation of glycerine and phosphorus, obtaining excellent results in influenza convalescence, &c. He speaks of his new medicament as exercising the contrary effect to antipyrin, the latter being given in cases of intense nervous excitability, whereas glycero-phosphates are intended as a treatment for nervous depression. The new preparation appears to resemble Dr. Ashburton-Thompson's solution.

British Journal of Dental Science.

LONDON, JUNE 1st, 1894.

TRAINING IN DENTAL MECHANICS.

When dealing with this question a year ago, we pointed out, as some explanation for the alleged falling off in strictly mechanical ability, that the curriculum claims an increased attention to operative work. There is also the old-standing remark as to the introduction of vulcanite, which, whilst bringing artificial teeth "within the reach of all classes," must have largely influenced the class of work in the ordinary laboratories. But although the present student has his attention directed more urgently than of yore to the duty of saving the natural teeth rather than to the ability to substitute artificial ones, it is precisely on the borderland of the operative and mechanical practice that a knowledge of technics will stand him in good stead. Crown-work, and its extensions, demands some of the most accurate and delicate manipulations associated with the methods of the mechanical dentist. Shall we admit that the complaint as to ignorance or inability of the modern apprentice in dental mechanics is well-grounded, and that it is brought into prominence by the improvement shown by the dental student in operative work? If so, one naturally enquires for the reason. The diploma-granting College examines the candidate in each branch. The curriculum of the licensing Bodies, with one exception, demands a certificate that the candidate has been trained in each branch, in the one case from a private practitioner, in the other from a recognised School. Is it possible that the difference in the results of hese two methods depends upon the system of work? In neither case does the certificate state any opinion as to the pupil's, or the student's fitness for examination. It is, in each case, a statement to the effect that he has had opportunities for becoming fit.

The College trusts in one instance to the private practitioner, and in the other instance to the Hospital authorities, that the candidate has received such instruction as may enable him to pass his examination. If operative work is to become the one thing needful, then the urgency of a knowledge of Dental mechanics on the old lines disappears; but although the future practitioner may not require to be able to accurately mount a full set of tube teeth in the least possible time, he will still need a practical experience of workshop methods.

On the other hand it may not be the teacher who is at fault, but the pupil. It may be that the present race of students is drawn from a different class of the community, and that instead of a natural aptitude for mechanics influencing the choice of avocation, the hospital and surgical aspect proves more attractive to those who now have to pass a preliminary examination in general education. It is not, however, in the least conceded that dental mechanics has yet been specialised out of the practice of dental surgery. There are indications that it may become so, and that the tooth-filler will leave to others the devising of artificial dentures. But even that condition of things would not obviate the discussion as to how dental mechanics can best be taught. Many an able practitioner undertakes this responsibility, and fulfils his duty well. We do not think that any change from the present arrangements should preclude such an one from continuing to do so. On the other hand we expect to see the Schools entering into competition with him, in fact some of them have already done so, and it is even claimed that under such auspices the pupil could acquire his knowledge better and in a less time than the orthodox three years. This view has not yet gained much ground. At a recent meeting of dentists a resolution in favour of retaining the old apprenticeship system was carried by a large majority. A motion, bearing upon the same question, which was passed unanimously, declared that it was desirable to have a preliminary examination in mechanical dentistry for students before they enter upon their surgical training.

As our readers are aware the Royal College of Surgeons in Ireland came to the conclusion it was unnecessary to demand a certificate of three years' instruction, and *The Medical Press* which has lately shown a *penchant* for discussing dental affairs, supports the action of the Irish College. It regards the retention of the apprenticeship system as an anachronism, but we can scarcely seriously criticise the article, for the writer is apparently under the impression that forty-five months' study of mechanical dentistry in an Institution recognised for that purpose, has been, and still is, required from the student in addition to the apprenticeship.

The National Dental Hospital.—The Students' Society entertained several hundred of their friends at a successful Conversazione on the 23rd ult. The New Building, being appropriatedly decorated, was much admired by those who had not previously had an opportunity of visiting it. The President, Mr. C. W. Glassington, received the guests in the Waiting Room, the Extraction Rooms being converted for the time into Ladies' Cloak Rooms. In the Stopping Room an attractive programme of music, whistling, and recitation kept all the seats occupied, Mr. Alfred Smith being assisted by some talented vocalists. The Mechanical Laboratory was visited by those for whom the oxy-hydrogen lantern had attraction, Mr. Spokes showing reproductions of some of Rembrandt's etchings and paintings, whilst Dr. Cunningham afterwards took his audience to the Chicago Dental Congress. Microscopes in the Board Room, the Phonograph in the Library, and Mr. Percy Cooper's Conjuring in the Demonstration Room provided additional amusement for the guests. Refreshments were served in the Lecture Hall, where there was also a programme of instrumental music throughout the evening.

THE DENTAL ASSISTANTS' ASSOCIATION.—An appeal is now being made to all the Dental Assistants of Great Britain to join an association for the advancement and protection of their interests. According to the Rules, a copy of which we have received, assistants who have served their apprenticeship with a practical Dentist are eligible for membership as "active" members; gentlemen having a practice of their own may become "honorary" members, but will have no voting power. Another feature is the proposed temporary relief of members when out of employment, and one of the Secretary's duties is to keep a Register for situations vacant or wanted.

A DENTAL STRIKE.—Not a strike amongst Dentists, but against one. It seems that in France a dentist is attached to all the lucifer-match factories, a very wise precaution in any case, but especially from the phosphorus point of view. At one of these factories, however, the work-people complained that the dentist hurt them too much, and, as they were obliged to pay him a visit at certain stated intervals, the only way of escape was to organise a strike of all the hands. The dentist resigned, another was appointed, and work was resumed.

A NEW DENTAL JOURNAL.—Senor Garcia Velez has undertaken the direction of a Dental Journal to be published at Madrid. The new venture is to be called *Revista Estomalogica*, and its programme includes the reform of dental education, the advance of dentistry in Spain, and the social and academical elevation of the profession generally.

Tuberculous Disease in Children.—There are good grounds for supposing that one-third of the young children who die in hospitals die from tuberculous diseases. As Dr. J. W. Carr points out, in an interesting paper in *The Lancet*, it becomes a matter of the greatest importance, from the point of view of prophylaxis, to ascertain in what way the bacilli usually obtain entrance. They may enter with the breath or in the food, and find their way into the blood current, but Dr. Carr thinks that passage through the lymphatics is the most usual. A non-tuberculous lesion, such as a patch of simple eczema, or a carious tooth is often followed by caseation of glands. Primary glandular caseation seems to occur most frequently in the cervical glands, and it is very probable that the bacilli obtain entrance through an unhealthy naso-pharyngeal mucous membrane, and especially through the tonsils, more often than is generally supposed. To increase the resistant powers of the system to the entry of the bacilli, the mucous membrane should be kept in as healthy a condition as possible.

The Saliva and Bacteria.—Grawitz and Steffen have written a paper in regard to the sputum as a cultivation medium. Steffen has shown that the sputum serves this purpose for the staphylococcus, strepto-coccus, and diphtheria bacillus. The pneumococcus present in the saliva soon loses its virulence, but when removed to pneumonic sputum regains it, and this is quite unlike anything that happens in the case of other artificial cultivation media. If injected into animals in its previous attenuated form it protects them against the pneumococcus infection. The diplococcus in the saliva and that in the pneumonic sputum have a different degree of virulence.

The Coryleur.—With reference to our recent remark that in using "Coryl" as a local anæsthetic it was difficult to tell whether enough remained in the cylinder to ensure anæsthesia, Messrs. Mengel write to say that by shaking the instrument it can easily be ascertained, by the sound, if any fluid is present. By deducting the weight of the Coryleur at the time of using from the gross weight when supplied, the exact quantity can be obtained, as is the case with nitrous oxide in steel bottles. Messrs. Mengel send us a circular illustrating a variety of nozzles which can be used to adapt the anæsthetic spray to different localities.

THE DENTAL HOSPITAL OF LONDON.--It has been arranged to hold an Exhibition of Pictures on behalf of the Building Fund, in the Galleries of the Royal Institute of Painters in Water Colours. It will be opened on the 25th inst. by T. R. H. the Duke and Duchess of Saxe Coburg, and will continue for a week. Besides the pictures by eminent artists, there will be music by the Hungarian Band and well-known musicians and vocalists. Tickets may be obtained from the Honorary Secretary, Mrs. Knowsley Sibley, 7, Upper Brook Street, from members of the Hospital Staff, and others on a long list of Patrons.

COMPANIES AND PERSONS.

The question of the liability of companies to penalties imposed by law on "persons" only, which has such a melancholy interest to pharmacists, turned up in the case of the United Alkali Company the other day, which was argued before an exceptionally strong Divisional Court, and which we report this week. The Company were charged under a Navigation Act of George III. with sending alkali waste into a brook at Widnes and thence into the Mersey. The Act prohibits "any person" doing this, and one of the arguments of company's Counsel was that the company was not a person. As far as we can gather from the reports, this contention was but little heeded. The Court, consisting of Lord Chief Justice Coleridge with Justices Wright and Kennedy, held that the company was a person within the meaning of the Act. There may be some reason for this judgment which we are not aware of; but we cannot believe that these judges would deliberately overrule the judgment of the House of Lords in the Pharmacy Act case, or that a company can be a person under one Act and not a person under another.

The Chemist and Druggist.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary monthly meeting, April 2, 1894. Mr. Frederick Canton, M.R.C.S., L.R.C.P., L.S.A., L.D.S., President, in the chair.

The minutes of the previous meeting were read and confirmed.

The following nominations were read before the Society:—Henry Barbery Rowe, L.D.S. Eng., 7, Cavendish Square, W. (resident); Gerald Bertram Webb, L.D.S. Eng., Guy's Hospital (resident); S. Ralph Apthorpe, L.D.S. Eng., 1, Tweedy Buildings, Widmore Road, Bromley, Kent (non-resident).

The following gentlemen having signed the obligation book, were admitted members by the President:—Leonard Brown, L.D.S. Eng.; Walter J. May, L.D.S. Eng.; Frank Morley, L.D.S. Eng.

The President announced that the following gentlemen had duly signed the obligation forms:—Frederick Haynes, 11, Hillmorton Road, Rugby; Percival Tookey Leigh, 6, Portland Crescent, Leeds; C. Harry Oram, 13, Royal Crescent, Cheltenham; Edward A. Manton, 14, Grande Rue, Boulogne-sur-Mer, France.

Discussion on Root-Filling.

Mr. **Baldwin** briefly recapitulated the various points of his paper read at the February Meeting.

Mr. W. H. **Woodruff** was afraid there was nothing he could add to the knowledge they had at the present time on the matter in hand. He might as well say at the outset that certainly since 1887 he practically never dressed a tooth. It was no doubt very bold to say such a thing, but he could assure all present that with that treatment, he had found superior results to what he ever did before under what he considered careful and continuous dressing. He could quite sympathise with gentlemen who were afraid to take up this course of treatment. He only began it in what he considered very favourable cases, and went gradually on until he had said at the present time he never dressed a tooth. He must qualify that to this extent, that supposing a case came to him in an acute state of periostitis with pus flowing down, and tenderness, he opened up the pulp chamber, but did not attempt anything in the form of dressing until the periostitis had subsided. Of course the same thing applied, if on the first visit of his patient, he had not sufficient time to go into the case thoroughly. Mr. Baldwin said one thing had been gained by the advocates of immediate root-filling, namely, that more thoroughness had been adopted in the treatment. It had resolved itself practically into treating the tooth at once in the vast majority of cases. If on the second visit of the patient, a root was found healthy having only been dressed once, would it not have been as well in such cases to have filled up at once on the first visit? That was one point which should encourage men to try immediate root filling. He quite agreed with what Mr. Baldwin had said with regard to thoroughness, but he asked what would become of the potential cavity supposing a temporary dressing was placed in the root? what would become of the contents of the cavity, or the products of the inflammation beyond the apex of the root? Was it possible by any amount of dressing put in the root to get at the contents of that potential cavity? It was very doubtful whether the cavity was ever properly reached, or whether the antiseptic placed in the root canal ever penetrated beyond. Of course he was speaking of cases without a sinus, in which antiseptics could not be pumped through. With regard to another class of cases, those with sinus, he could not quite agree with Mr. Baldwin because he thought the root should be thoroughly cleaned out,and if possible of course an antiseptic passed through the sinus, but after having once rendered the root perfectly aseptic it should be filled up at once, and the easiest practical way to deal with the sinus, if it persisted, was from the outside. Coming to some of the methods of treatment, he agreed with what had been said in advocating a sufficient access to the cavity. It was one of the most important things to be able to get fairly at their work, so as to pass the instrument down with no bend at all, or with the least bend possible. It was most essential that that should be done. On the other hand, he did not approve of enlarging the roots at the other end to any depth down beyond where they could see where they were going to place their fine-pointed instrument. His reason was that they could not possibly get down to the extreme end of the pulp canal, because of the risk of passing the instrument right through the apex, and if they did not do that, there was very often the difficulty of leaving a square shoulder where the drill left off, and against which it was almost impossible not to stop in the treatment, the result being that the lowest portion of the root, the most important part in the whole treatment, was often left absolutely untouched and empty when the stopping was finished. Then again, instead of using hooks, he thought the better method of cleaning out the canal was with Donaldson's cleansers. They could be got further down. The cleansing should be done very carefully, passing the instrument carefully down and pulling the *débris* up. He agreed that much care ought to be expended, not only at that part of the proceeding, but later on in using any antiseptic, not to pump or force the *debris* through. This was another reason for deprecating the use of drills, because that was a very likely method of forcing some of the *debris* through the apex. Then as to disinfection. His practice was to use peroxide of hydrogen. That seemed to be a very useful drug, and he had certainly obtained better results with it than with anything else. He had tried bichloride of mercury, but had gone back to peroxide. He was extremely careful always not to use anything which was a coagulant, and that was a point which had to be thought of. Anything which would coagulate the albumen, and so prevent the action of whatever drug they wished to use, should be avoided. After the root was perfectly aseptic, it should be thoroughly dried out with hot air. He always first filled his roots with a solution of chloropercha using the red base plate and chloroform, that of itself being a germicide and antiseptic. After using this mixed to a creamy consistence on a very fine instrument on some particles of wool, he passed a point of hard gutta-percha to the apex, or even in some cases passed up a wire and left it there if the root was small. Upon that he put some oxyphosphate of zinc, sealing the roots, and the crown of the tooth could then be filled with anything they liked. There was occasionally a little tenderness about the tooth for a day or two, but it would nearly always subside. He did not remember a case having come back during the last twelve months in which he had to extract. There had been some little trouble, but after an application of iodine, a little local bleeding and so forth, the teeth had settled down and become satisfactory. Mr. Baldwin had dealt so fully with the advantages to the practitioner of immediate root filling that it was unnecessary to enter into that again. He had merely wished to emphasize the advantage he had found in his own practice, and to express his belief that if others would carefully follow in the same line they would be astonished at the results.

Mr. J. H. Redman said he had great faith in immediate root filling, though he could not go so far as to say that he never dressed a tooth ; because in cases where pus was welling down the nerve canal, it was most important to dress for a few days. The great point was the cleansing of the cavity, and he had great faith in the plan mentioned by Mr. Woodruff. For disinfecting, he used a solution of hydro-naphthol which was one of the most perfect disinfectants that he knew of. It was perfectly harmless ; it was not like carbolic acid producing an eschar, and it did not coagulate the albumen. After thoroughly cleansing he generally filled with Weston's non-irritating stopping mixed with an antiseptic. That could be packed most efficiently in a liquid condition, and packing it in with cotton they could get it well to the apical foramen without any fear of it going through. The chloro-percha was apt to do that, and produced considerable irritation in some cases. After filling the root-canal he always, as Mr. Woodruff suggested, filled the upper part with oxyphosphate of zinc, and then finished with gold or amalgam. No doubt the great point to be aimed at in root filling was to get free access to the canals, and that was a very great point in the treatment. In many cases he had seen cavities filled in dead teeth, where it must have been impossible to reach the canals. Many practitioners seemed afraid in such cases to cut away the structure of the tooth. He thought that was altogether a mistake, and would much rather cut away a good slice of the tooth so as to get free access to the root canals, than run the risk of losing the tooth by not being able to treat it thoroughly. He could endorse Mr. Baldwin's statement by saying that in the majority of cases he should advocate immediate root filling. If there was any tenderness after filling he used the fluid extract of Jamaica dog-wood, which had a far better effect than the tincture of aconite and iodine.

The Secretary read a letter from Mr. Grayston as follows ;

As I am too far away to attend the Meetings of the Odontological Society, may I be permitted to add my mite by letter to the discussion on root filling started by Mr. Baldwin, viewing it from the practical standpoint of everyday practice ? Take a septic root without complications, cleanse it thoroughly with instruments, using in connection therewith any of the antiseptics favoured by immediate root fillers, such as peroxide of hydrogen, perchloride of mercury, or carbolic acid. Where the root is clean and apparently sweet fill it loosely with cotton wool and seal up the cavity of decay with temporary gutta-percha. Now if this cotton wool is removed after two or three days, it will be found to smell very foully. Presumably this is due to the dentine giving up the odours of putrefaction, which it had previously absorbed. Is it a clean or scientific operation to cork up this malodorous vapour, by immediate root filling? Probably Mr. Baldwin is right in saying there is nothing to support the idea that the pericementum can ordinarily be infected through the substance of the dentine and cementum. It has been stated, however (I think by Mr. Kirby), that water can be made to go right through the solid structure of a tooth, and if this is correct, why not infectious vapour? But granting that the pericementum can only be infected through the apex of the root canal, have we any means of hermetically sealing this opening with a certainty that it will *remain* sealed in the majority of cases? During the last twelve years I have tried many methods of root filling, and I do not know of one that can be called a perfect method. Many materials are difficult to insert, and the work being done—so to speak—in the dark, renders accuracy of manipulation doubtful. Some materials are easy to insert, and very perfectly fill the root canal for a time, but eventually they become absorbed, and they become porous, and they shrink. Given a clean and thoroughly disinfected root, good results are obtained, notwithstanding the imperfections of the root filling. In fact I am led to believe from experience, that given the above conditions, there is no operation in dentistry that will give such good results for imperfect work as root filling. But it is necessary for the root to be thoroughly disinfected, and we do not get this by the immediate method. I have practised the immediate method, and for the time, at any rate, had a success that astonished me, but I have no confidence in it as a method of daily practice. I agree with Mr. Baldwin, however, that an experience in immediate root filling is very valuable. Since the value of certain of the essential oils has been brought to the notice of the profession, notably the oils of cassia, cinnamon, and peppermint, the treatment of roots by "the dressing method," has been simplified and greatly improved. If one of these oils is used as advised by Dr. Harlan, the time spent by the patient in the chair need not be much in excess of that which would be occupied by an immediate operation, particularly if the treatment takes place at visits for other operations as well. I quite agree with the general principles advocated by Mr. Baldwin, and desire to thank him for his root filling of hydro-napthol, French chalk and eucalyptus oil. It is new to me, and I shall certainly make trial of it.

Mr. F. J. Bennett said he had been for some time past waiting with some amount of curiosity to find how far immediate root filling would supersede other methods. He was satisfied that in Mr. Woodruff's hands immediate root filling was a great success. The practice appeared to be advocated upon two grounds; first, that it was a quicker method, therefore commending itself to the practitioner; and second, that it was a better method. As far as his own experience was concerned, he should have thought that it could not have been so easily proved to be a better method in the sense of doing the work more thoroughly, and Mr. Baldwin was hardly fair in saying that it ensured a more thorough opening up of the root canal and a more thorough cleansing. It was a little hard upon their best class of practitioners, who for years had had plenty of success in the treatment of dead teeth, and must, in consequence of that success, have cleared out the roots thoroughly well; because if they did not do so, it implied that germs must be still there, and he could not see how germs could have been there if the teeth had gone on comfortably year after year; it must consequently be granted that the work was thoroughly done. The advantage of immediate root filling could only be put on the ground that it was quicker, and therefore claimed to supersede the other method. He had in his old method of treatment, which was not immediate root filling, found usually that it was more convenient to prepare the cavity one day and then leave it for a time, but he quite recognised that there were occasions when it was very desirable, if possible, to fill and complete a tooth on the same day. He was in sympathy with both parties. In some hands, no doubt, immediate root filling was a very excellent plan. There were two points he would mention in regard to Mr. Baldwin's questions. The first was that Mr. Baldwin did not consider that micro-organisms penetrated to the periosteum in any way through the substance of the tooth, that is to say, through the dentine and cementum. Mr. Bennett was not aware that the matter had ever been put to the actual proof of microscopic examination, but it should be as easy to demonstrate the presence of micro-organisms in the dentinal tubes of the root, as it was in a carious cavity, and his own opinion was that in such a specimen, micro-organisms of putrefaction would be found present in the dentinal tubes, and also in the cemental cells, and in that way would get to the periosteum. Otherwise he could not explain that class of roots in which they found the apical foramen much reduced in size, or perhaps hardly visible, and three or four vascular canals penetrating the side of the root and passing inwards to the pulp cavity. These, and other evidences of extreme activity in that region, convinced him that there must be some irritation produced by the organisms passing directly through the substance of the root to the periosteum without going through the apex. The point was raised as to whether micro-organisms or antiseptics could penetrate into the abscess cavity when it existed. It was perfectly evident that they must do so. Abscesses exist in almost all chronic dead teeth, and undoubtedly those teeth were curable after being treated. He could only conceive it possible that they were cured by the destruction of the micro-organisms, and they could only be destroyed by the action of antiseptics. It might be said that although the antiseptics did not penetrate to the abscess cavity, yet the organisms being deprived of air dwindled and became inert. That might be a possible position, but for his part he imagined that antiseptics did penetrate the abscess cavity. He had been very much impressed by the whole discussion, and had come to learn rather than to teach.

Mr. R. H. Woodhouse said there were one or two points that did not appear to have been touched upon. With regard to the three classes of cases for immediate filling, he could assume that where a nerve had been destroyed by arsenic and carefully removed, there was no reason whatever why the fang should not be at once filled and the opening closed so as to prevent any further contamination. In the second class of cases, where there was a sinus at the end of a fang, immediate root filling might be adopted, every precaution being taken to remove all septic matter, and to get the antiseptic solution to pass through the sinus and thoroughly cleanse it. Even in those cases, however, where apparently success had been obtained, he had noticed a recurrence of the sinus, it might be at the end of a few months, or a year. The sinus having disappeared, there was a certain tendency for it to come back-thereby causing a good deal of disappointment. With regard to the third class of cases to which Mr. Woodruff alluded, although he (Mr. Woodhouse) tried to be a fairly plucky practitioner, and, he hoped, a careful one, he had not quite come to the position of filling such cases without a little preliminary treatment. If there was any discharge down the fang he was certainly very diffident about closing up the cavity, at all events for a few days, or if he did so he should warn the patient of the probable consequences. The iodine liniment had not been alluded to. In long standing cases where the fangs were very unhealthy and had been in that condition for some time, he found better results from the iodine liniment than from any other antiseptic he had yet used. It entered into combination with any albuminoids that might be present and certainly made them inert. He sometimes filled fangs with iodine liniment for two or three days, and such teeth as a rule went on extremely well, whereas with any other disinfectant he would have had a great deal of fear. After destroying the nerve and filling the fang in the ordinary way he did not as a rule fill the tooth with metal for some time. It was always better to put in a gutta-percha filling for a few months or weeks ; the pressure on the tooth was less. He used carbolic acid and oxide of zinc on cotton wool as a permanent root filling, if any root filling could be called absolutely permanent. The old practice of getting gold to the end of the fang was extremely good ; but its application was so difficult that it was almost extinct, and he supposed would never be revived again.

Mr. J. F. Colyer said, like Mr. Woodruff, he was in favour of immediate root filling. He adopted it with great caution at first, but finding it was successful, he had now arrived at the practice of filling nearly everything bythe immediate method. Mr. Baldwin had stated that pericementitis was more frequent after immediate root filling. He (Mr. Colyer) did not find that was the condition, and if he thought that by treating teeth by the dressing method he could get better results, he should certainly go back to it. He was rather inclined to agree with Mr. Woodruff that better results were obtained by the immediate method, and so long as that was the case he should continue to adopt it. He had been looking very carefully and anxiously for the results of some of his cases treated four years ago, but he did not remember any in which teeth had had to be extracted after filling by the immediate method. Immediate root filling had taught them to be very much more careful in the removal of *debris* from the canal, and in the treatment of roots. One point upon which he laid great emphasis was not to remove the *debris* from the root canal too quickly, for fear of pushing septic matter through the apex. The method of removing the septic matter he adopted was as follows: With a hooked Donaldson he removed the *debris* from the region of the orifice of the canal, he then introduced into the same part of the canal some peroxide of hydrogen, or other suitable drug on cotton wool wound round a fine instrument, and instead of employing a pumping action he used a slight rotatory movement, thus avoiding the risk of pushing septic matter through the end of the canal. Having cleansed the orifice of the canal he next removed some more of the *debris* and again applied his antiseptic. By adopting this gradual method of removing the *debris* from the canal, he thought the risk of pushing septic matter through the apex was reduced to a minimum. With regard to the use of drills, like Mr. Woodruff he must certainly say he was not in favour of reaming the canal. He believed that a root canal treated without reaming could be filled much better, they did not get the shoulder near the apex, and the root filling could be passed nearer to the apex. Reamers were very useful where the dentine was thoroughly softened through contact with septic matter. One class of cases which he found very difficult to treat was those of large apices. He believed that rizodontrophy was occasionally useful in these cases, for if they thus filled a root where absorption was taking place the root filling would soon protrude through the apex, and so act as an additional irritant, and hasten the loss of the tooth. He should be glad to hear opinions as to the treatment in such a case. He had adopted the method spoken of by Mr. Brunton, of sponge grafting on two occasions, and with great success. Mr. Brunton, in such cases, passed right up through the apex into the apical space a sponge graft rendered thoroughly aseptic, and left it there. This certainly seemed to open up the method of treating these difficult cases. He would be glad to know if any member had had any experience of a combination brought before the Chicago Congress, namely, kalium natrium. The drug was applied on a fine instrument such as a plain Donaldson bristle into the kalium natrium and then passed straight into the putrid pulp. They often got a little frizzling, and, as a matter of fact, there was a good deal of heat produced. The idea was that the kalium natrium united immediately with the fatty material in the pulp and sterilized the root canal at once, the heat generated acting, to a certain extent, as a germicide. In experiments out of the mouth he treated three molars by this method, and it seemed to hold out the best hope of treating such canals as those found in the buccal roots of upper and the anterior roots of lower molars. In one of the three experiments, a small bubble appeared at the apex of the buccal roots, and whether that would cause any trouble in a tooth *in situ* he could not quite say, but nevertheless there was a certain amount of effusion through the apex. He had tried it twice on teeth in the mouth, and in both cases it was a success. There was one drug that he was using rather more now than formerly, and he used it in preference to peroxide of hydrogen, viz., sodium peroxide, about which Dr. Kirk had written an interesting article in the *Dental Cosmos.* Its advantages were that there was a greater amount of oxygen available and that it readily united with the fatty material in the root canal, and so rendered the operation of cleansing the canals easier. The more he used sodium peroxide the better he liked it, and he got root canals aseptic very much more quickly than with peroxide of hydrogen. With regard to treating canals by the immediate method where pus was present, he did not think any immediate root filler under those conditions would think of filling the root. One of the greatest points in immediate root filling was to be sure that it was dry to the apex. Unless he could get the root canal thoroughly dry he should certainly not fill. But even when a certain amount of pus was present,if the peroxide was pumped through into the pulp sac, he saw no reason why it should not kill the micro-organisms that were present, and thus render the pulp sac inert. He mentioned the case of a medical man who had had a tooth treated for some months, cotton wool being put in to soak up the discharge coming down from a chronic abscess. He (Mr. Colyer) treated the case by the immediate method. That was three and a half years ago. It was still perfectly sound and tight. The case was undoubtedly one of chronic abscess at the apex of a tooth, without a sinus. He could only explain it on the theory that the peroxide destroyed any organisms existing, and so rendered the abscess cavity inert. In drying root canals he always adopted the method of treating them thoroughly with the hot air syringe, and after that with a root canal dryer, which he thought of great value. Another difficult point in practice was the treatment of buccal roots in upper molars, the roots of bicuspids, and the anterior roots of the lower molars. His method, when the canals were small, was to leave such canals alone. The question of drilling such canal did not commend itself to him, for he doubted if they ever got to the apex, while they ran all the risks attending the use of canal reamers. Such cases were better left alone; though, of course, he would prefer if possible to treat them thoroughly. He mentioned the paper recently communicated to the *Ohio Dental Journal* where the use of sulphuric acid in the treatment of such root canals was mentioned, it being maintained that by the judicious use of a fifty per cent. solution of sulphuric acid, applied upon a suitable instrument, a way could be gradually opened up the canal. The fact was that by introducing the sulphuric acid up the canal the dentine in the neighbourhood was softened. The plan was highly spoken of, and seemed worthy of trial. Root canals in which the pulp was semi-calcified were exceptionally difficult to treat. In cases where they were unable to remove all that remained of the pulp he was rather inclined to use the much abused drug, iodoform, on this principle, that it exerted its action, not so much by killing the organisms, but by combining with the ptomaines produced by the micro-organisms and rendering them inert. He thought iodoform was preferable to the sublimate, for the reason that sublimate produced such a discoloration of the tooth. He was glad to hear Mr. Redman speak in favour of the method of opening up the tooth and getting a thorough view of the canal. That was one of the great secrets in any method of root filling.

Mr. Thomas G. Read said he concurred as to the importance of opening the cavity so as to obtain free access to the pulp chamber, he did not believe in drilling out the canals, except well cutting away the constriction at the entrance of the pulp canal, thus forming it funnel-like in order to avoid the wringing-like action of the constriction if left. He strongly objected to enlarging the whole length of the canals as they are usually quite large enough, and besides the chance of piercing the side, septic matter may be forced through the apex; this may be demonstrated by drilling out the canals of a freshly extracted tooth, when the apex was approached by the drill, a small worm-like piece would be forced out at the foramen. For washing out he preferred perchloride of mercury, three grains to an ounce of alcohol. The alcohol helped to dry the canal, and the perchloride was left in a thin layer on the inside. As a rule, he did not like syringing out canals, as septic matter might very likely be driven through the apical foramen, especially in lower cases. He was a great believer in the warm air syringe, which he used several times during the operation of washing out. With regard to the bristles sold, he said they were usually too thick and always too smooth, it was very awkward indeed to wind wool tight on a smooth bristle, and as it was introduced into the canal the point was uncovered, also there was a piston-like action easily produced, especially if the wool carried any fluid ; in such a case the wool would jam against the walls of the canal, the fluid introduced would be squeezed towards the mouth of the canal, and the septic matter forced towards the apex. Bristles should be filed fine and roughened with a coarse file, then the wool could easily be twisted on and would stay where it was put on the bristle, and the piston-like action thus be avoided. With regard to root fillings, in most cases he preferred a thin solution of gutta-percha and chloroform, but in the few cases where all the pulp could not be removed, thin oxychloride of zinc seemed to answer very well. It was said by Dr. D. F. Whitten to turn the pulp tissue into leather and thus close the apex. He did not like the idea of leaving wool soaked in a solution of gutta-percha in the canal mentioned by Mr. Baldwin, as he believed if la piece of wool was left in, the canal could not be thorou ghy filled as the wool would jam against the walls and prevent the gutta-percha cone driving the solution to the apex. Having thoroughly painted the canal by means of a little wool upon a fine roughened bristle with the solution or the thin oxy-chloride of zinc, a gutta-percha cone should be introduced, these should be made similar in size to the canal as wanted, and on being pressed home would act as a piston on the fluid painting and fill up the apex, it did not seem to do any harm if a little gutta-percha was pressed through the apex, but this was best avoided by watching the patient as the cone was pressed home. With regard to after treatment, patients now and then, had a little pain, and in such cases he recommended his patients mostly to take a couple of teaspoonfuls of Carlsbad sprudel salts in a little warm water on an empty stomach. It was a mild cathartic but seemed to answer well in such cases.

Mr. Storer Bennett said the successful treatment of roots entirely hinged on the question of their being cleansed. Whether by spending a long time at one single operation, they could render the roots and the apex aseptic and fill with gutta percha, or whether by successive dressings they ultimately achieved the same object made little or no difference. Although no doubt a very considerable amount of trouble had been taken by the advocates of immediate root filling, they claimed a little more than was perhaps intended, when it was said that they took such a very great amount of trouble in dressing their roots, and thereby attained a much greater amount of success. He agreed with his brother in thinking that a very large amount of exceedingly good work had been done for years, and was being done at the present time, by those who had never attempted immediate root filling. Referring to the use of such drugs as peroxide of hydrogen, peroxide of sodium, and sodium and potassium, no doubt they generated an ebullition of gas, and in using them there was very considerable risk of driving the putrid matter through the apex. They therefore, ought to be exceedingly careful how they used any of the drugs which did generate oxygen, and so might drive small portions of the pulp through the apex. Mr. Baldwin seemed to lay rather more stress than he fairly ought on the care taken to open up the root canal properly by those who adopted immediate root filling. There were a large number of practitioners who did gain access to root canals so as to see them thoroughly, and some few years ago, a paper was read by Mr. Hern in which he showed how he considered the root canals of various teeth should be treated. That was before the period of immediate root filling, or at any rate it was not the result of the teaching of immediate root filling. He would like to have some instruction as to the pathology of what Mr. Baldwin called the "potential cavity," and also of the "abscess cavity." He could not understand how when there was any kind of eating away of the bone, or erosion of bone at the end of a tooth which became filled either with granulation tissue or occupied by an abscess sac containing fluid—he could not understand how such a cavity could be washed out or dried so thoroughly that no discharge came from it, and that gutta percha or any other dry substance could be put into the root canal and produce a filling up of the bone cavity, or a safe condition of that cavity however it was brought about. As for the potential cavity being filled up with granulation tissue, he regarded that as hypothetical, but he would like a little more explanation as to what Mr. Baldwin considered the pathology of such cases to be. He wished to add his testimony to the value of the much abused drug iodoform. He was confident, no matter what scientific experiments might show out of the mouth, that clinically very valuable results were obtained from its use, and thought it only fair that whatever might be shown by bacteriological cultivations, as long as they got successful results in their operating rooms they should give the credit to the drug that it deserved, and he believed they would be quite safe in using it in a very large number of cases.

Mr. Beadnell Gill asked how they were to distinguish safe cases for immediate root filling, from those which were unsafe.

Mr. Baldwin, in reply, said he was not an immediate root filler of at all a pronounced type. His position was that a certain number of cases of dead teeth were certainly safe to fill immediately, but others were not safe at all, and even those cases which were safe could not always be selected beforehand. If there was any serious doubt, it was better to defer the filling, or to put in a trial filling. With reference to the disinfection of the potential cavity, he believed it could often be done at once with peroxide of hydrogen or some volatile antiseptic ; or if not quite disinfected, it would be sufficiently so to enable the natural processes to deal with the micro-organisms. With regard to filling a tooth with a sinus immediately, and treating the sinus from the outside, he thought that pumping the antiseptic through was the most perfect method, if the cavity was fairly small. There were, however, cases where a cavity could not be washed out in that way, but must be considerably enlarged on the outside with an escharotic and a drainage tube put in. With regard to the use of nerve-canal drills he thought it better unless the canals were very large to use the fine drill as far as it would go with moderate pressure, taking care not to let it slip through the end. It should go as far as possible towards the apex because it made the canal easier to fill, and the stopping could be removed much more easily than if the canal had not been drilled. It was also the best way of removing particles from the canal, for sometimes a drill would get out particles that could not be got out in any other way. A Morey drill if properly made, would not cut any shoulder whatever. The drill terminated in a probe point, and the cutting wings fined away to nothing, so that there was no shoulder possible. He agreed with Mr. Woodruff in considering chloroform a very efficient antiseptic, especially when mixed with eucalyptus oil. With regard to the frequency of extractions necessary after immediate root filling or treatment by dressing, he considered the two or three per. cent. of failures sometimes spoken of enormously high He should be inclined to put his own failures after filling dead teeth, which were found dead at about one per mille. It was exceedingly small, in fact, during the last four or five years he had never had to remove a tooth which was treated when found dead. Teeth which had to be killed with arsenic came into a different category. The most dangerous teeth to fill immediately were the lower bicuspids, when there was any pus welling up through the root. Possibly that arose partly from the force of gravity being against any effective drainage. Oxyphosphate of zinc cement was a very good filling, but not so good as solution of gutta percha, *plus* gutta percha points, because it was more difficult to remove. If a tooth had to be crowned later on it was a great advantage to be able to get out the root filling immediately. With regard to the permeability of dentine and the possibility of forcing water through, he believed that water could be forced through any known substance, even wrought iron and glass, if sufficient pressure was used, but under ordinary circumstances, dentine and cementum together were not very pervious. The point he raised was not whether micro-organisms could travel along the dentinal tubules, but whether the peri-cementum could get infected that way, and he did not think it could unless there were pathological channels which existed only rarely. In the case of the abscess cavity his idea of the pathology was that very often there was an actual cavity filled with pus. In other cases the septic matter in the root canal produced a certain amount of periostitis followed by rarefying ostitis resulting in the removal of the hard structure of the bone, and granulation tissue being left; and in other cases again where there had been a large abscess cavity filled with pus it would, to some extent, fill itself up by the growth into it of processes of soft granulation tissue. In reply to Mr. Gill, he said the unsafe cases were decidedly those where there was pus or where they could not get satisfactorily towards the apex. Most of the other cases were very safe, but it was better to try them first before permanently filling.

The thanks of the Society having been accorded to Mr. Baldwin and others who had taken part in the discussion, the meeting terminated.

Dental News.

GENERAL MEDICAL COUNCIL.

The first meeting of the Council was held on Tuesday, the 22nd ult., and during the course of his address, referring to dental business, the President, Sir Richard Quain, Bart., said:—Several questions connected with Dental business will require the attention of the Council. The Education Committee will present a report on the subject of Dental Apprenticeship, as a portion of the curriculum has been given up by the Royal College of Surgeons in Ireland, a course which is not in accordance with the practice of the other Royal Colleges, nor with the opinion of the Dental Profession. Other Dental business will be the consideration of the communications from the Home Office in regard to a petition to Her Majesty presented by Mr. T. F. Tracey, a person with whom many members of the Council and its officers are already familiar, through his troublesome and offensive correspondence, and the answers thereto which have been sent in accordance with the advice of the Council. Mr. H. F. Partridge, with whom we have been so continually engaged in litigation, appeals for merciful consideration of his position. His statement of the reason of his erasure from the Dentists' Register is not, however, correct, as he was not deprived of his qualification by the Royal College of Surgeons of Ireland for advertising, but for having broken his pledge to the College not to do so. A memorial has been received from the British Dental Association suggesting the advantages which would result as regards economy of time and simplicity of process were a dentist familiar with the necessities of his Profession a Member of the Council.

Saturday, May 26th.

Sir R. Quain, Bart., in the chair.

The Council considered the Report by the Education Committee, on the curriculum for the License in Dentistry granted by the Royal College of Surgeons in Ireland.

Dr. Batty Tuke, (chairman of the Committee), said the Report shewed that in the Regulations for the License in Dentistry approved by the Council of this College on Aug. 8, 1884, evidence was demanded "of having been engaged in acquiring a practical knowledge of mechanical dentistry for at least two years in a public laboratory recognised by the College, or for at least three years under the instruction of a registered dentist. The candidate shall also submit a piece of mechanical work certified to be of his own making." The Committee had reason for believing that this Regulation was never carried into effect. The secretary of the Council of the College, in a letter to the Chairman and Committee said, "I believe that when the Regulations of this College were first made in 1879, recommendations of the General Medical Council were adopted in their entirety, and the rules as to 'three years' mechanical dentistry' was, as you say, one of them. I cannot say that in fact it ever was enforced or disregarded, because even since as far as my recollection serves, only one or two candidates have presented themselves under it. At the date of the last revision this College 'reduced' (as you say), the requirements to a Recommendation."

For this Regulation the following was now substituted:"The candidate is recommended to devote at least three years to acquiring a practical knowledge of dentistry, under the instruction of a registered dentist." The necessity for insisting on the production of evidence of having undergone a course of instruction in mechanical work by those purposing to practice dentistry was obvious. It was impossible to test by any system of examination the possession of a knowledge of the manipulative processes which form the greater preparation of the work of a dentist. This could only be acquired by actual practice in the workroom. The other Licensing Bodies had adopted and maintained the recommendation of the Council, and it was manifestly unfair that the candidates for any one License should be exempted. The Committee recommends "That the Council intimate to the Royal College of Surgeons in Ireland, that unless the prescribed course of study for its License in Dentistry be amended so as to bring it into compliance with the requirements of the Council, prior to the next examination for said License, the Council will feel it to be their duty to report to the Privy Council, in accordance with section 23 of the Dentists' Act, 1878, "That it appears to the General Council that the course of study to be gone through in order to obtain the License in Dentistry of the Royal College of Surgeons in Ireland, is not such as to secure the possession by persons obtaining such certificate, of the requisite knowledge and skill for the efficient practice of dentistry and dental surgery"; and further, to request the Privy Council to make order that the certificates granted under their present regulations, by the Royal College of Surgeons in Ireland, shall not confer the right to be registered under the Dentists' Act." He concluded by moving that Regulation.

Dr. McAlister in seconding the resolution, said the Dental profession generally, regarded this departure of the Royal College of Surgeons of Ireland, as one of the greatest importance, and strong memorials had been presented from the Dental Hospitals of London, Glasgow, Manchester, Liverpool, Edinburgh, and others. The memorials showed that the Dental Profession at large were strongly opposed to this arbitrary curtailment of the Dental Curriculum for Licentiates in Dentistry. He believed that a considerable number also of those who upheld the dignity of the profession in Ireland itself, were of opinion that a false step had been taken by the Royal College of Surgeons, and were anxious that the strong representations made on this side of the channel should have effect. The Dentists' Act laid down in a very exact way, the manner in which the curriculum should be carried out, and it was proposed once more to give the College an opportunity of reconsidering its great departure from the practice of the other Licensing Bodies, and in doing that the Council was doing all that could be required, to give them a *locus penitentiae.* He did not think it would be necessary to go to the Privy Council, but as that was the basis on which they had to act it was necessary to refer to it.

Sir Philip Smyly said he was informed by the President of the College of Surgeons of Ireland, that the College were determined to carry out the views of the General Council in the fullest way, and that they would cancel that resolution about withdrawing the three years. He could therefore assure the Council on the authority of the President of the College, that the views of the Council would be carried out fully by the College of Surgeons of Ireland. He would move as an amendment that the words of threatening contained in the motion should be omitted.

Rev. D. Haughton seconded the amendment. He thought after hearing what had fallen from the representative of the College, it could hardly be considered necessary to press the resolution. They had the assurance of Sir Philip Smyly that what was complained of had practically been withdrawn.

Dr. Tuke said they simply had the assurance of the College. They had no means of knowing what would be the decision of the Council of the College, and it would greatly strengthen the hands of those who desired to see the change made, if this resolution was passed.

The amendment was withdrawn, and the resolution adopted.

It was then moved by Dr. Tuke, seconded by Dr. Bruce, and agreed to:—"That in order that the Council may be assured that the requirements specially dealt with in this Report, and other requirements, are being fully complied with, they shall in accordance with Section 22 of the Dentists' Act, 1878, appoint an Inspector or Inspectors whose duty it shall be to visit and report on the examinations conducted by the Bodies granting qualifications in Dentistry, with special instruction to examine the Schedules and certificates presented by every candidate, and that it be remitted to the Examination Committee to consider the best way of carrying out the inspection."

May 28.

Sir Richard Quain Bart., in the chair.

DIRECT REPRESENTATION.

The Council proceeded to the consideration of the following communication of the British Dental Association ;—

40 Leicester Square.
"London, W.C.: *May* 21, 1894.

"Sir,—The *Dentists Act* was passed in 1878, and its admininistration was entrusted to the General Council of Medical Education.

"In the course of events many questions have arisen which, in the opinion of your memorialists might have been considered with economy of time, and by a simpler process if a Dentist familiar with the necessities of his profession had been a member of the General Medical Council.

"We therefore beg to respectfully point out to you that there are now many Dentists holding full Medical and Surgical Qualifications (some with University Degrees), and that certain of them are familiar with the varied phases of the questions which come before the Medical Council in the administration of the *Medical* and *Dentists Act*, so that by virtue of their general Medical Qualifications they would be fully competent to take part in the general business of the Council, whilst as practising Dentists, they would be capable of advising the Council in reference to Dental matters.

"Not wishing to add to the mass of Dental business now before the Council, we beg to recommend the suggestion of one or more *Dental Representatives* being added to the Council for your favourable consideration, leaving the matter entirely in your hands to take what course you may deem best, without seeking to embarrass you by asking for any definite pledge.

"On behalf of the British Dental Association,

"We have the honour to be
"Your obedient servants,
"*President*—CHARLES S. TOMES.
"*Pres. Representative Board*—S. J. HUTCHINSON.
"*Hon. Secretary*—W. B. PATERSON.
"*Vice-President*—JAS, SMITH TURNER.
"*Treasurer*—W. H. WOODRUFF.

"*To the* President *of the*
"General Medical Council of Great Britain."

Sir William Turner moved "That with regard to the communication from the British Dental Association, in which it is suggested that one or more Dental representatives be added to the Council, the Council is not prepared to adopt this suggestion." He said the Resolution was first drafted to the effect that the Council was not prepared to recommend a Bill to be introduced into Parliament. It was then pointed out that it was not necessary to go to Parliament for the purpose of adding a Dental representative, it being provided by a subsection of Section 10 of the Medical Act of 1886, that "The General Council may at any time represent to the Privy Council on any of the following matters:—That it is expedient to confer on any constituent Body for the time being returning a member for the General Council collectively with any other Body or Bodies, and being in the opinion of the General Council of sufficient importance to be worthy of such a privilege, the power of returning members to such Council separately. He read that as meaning that if any one of the Medical Bodies returning a member to the General Council, could get a second member in combination with other Bodies, a second member might be got. He understood the construction those who were moving in the direction of special Dental representation put upon this section was that they were the constituent Body or Bodies to return a member. That was such a strained interpretation that it could not be considered for one moment. He believed therefore that the original form in which the motion was drafted was correct; viz., that if a Dental representative or representatives was to be added to the Council it could only be through an Act of Parliament. Still, in order to cover the whole question, the motion was ultimately adopted in its present form.

Mr. Wheelhouse seconded the motion.

Mr. Brudenell Carter said he did not quite understand the wording of the Resolution. He quite agreed that Clause 10 had no reference whatever to the petition, but at the same time it would be more courteous at any rate to say that the Council replied to the Association that it had no power to adopt the suggestion. The British Dental Association must be perfectly well aware that there was nothing to prevent any man who held a medical qualification in addition to a dental, from being appointed a crown member or elected as a direct representative, and their course would be to make such a representation to the crown or to the profession at large as might induce the election of a person with a dental qualification. He would ask Sir William Turner to alter the Resolution so as to express the belief of the Council that it had no power to adopt the suggestion.

Sir WALTER FOSTER urged that the amendment should be received, because he should oppose the motion in the form in which it stood. It would certainly be his view that the dentists were hardly treated in having no member on the Council, and he looked forward to the time when they would have some representative. He did not think the Council had power under the Act of Parliament to give such a representation, but should at the same time be very sorry to send in a curt reply that the Council were not prepared to adopt the suggestion.

Sir JOHN SIMON urged that the Dentists had no more claim to a seat at the Council than Gynæologists or any other specialists. Those Dentists who were members of Colleges were already represented through their College representatives.

Dr. MACALISTER quite agreed that Dentists had no better claim than any other Specialists.

Dr. HERON WATSON said he understood the idea was that a Dental member should be present when Dental business was considered and not at other times. He hoped something would be done to show that the Council had no leaning in that direction.

The PRESIDENT said the President of the Representative Board of the Dental Association, a very eminent Dentist, Mr. S. J. Hutchinson, had written to him, and he founded the claim of his profession to representation on the fact that whilst in Scotland and Ireland there was a representative for about every 600 practitioners, there were 1277 dentists holding diplomas from the Royal Colleges who had no representative.

SIR WILLIAM TURNER said he wished to clear himself entirely from anything like a charge of discourtesy. There was no such intention on his part. The motion was a simple statement of the position he thought the Council would take up. He was willing to alter it as suggested if the Council thought it represented the actual state of the law.

SIR WALTER FOSTER said he believed they would eventually have a dentist in that room nominated by the crown. What he should much prefer would be that there should be a dental representative who should come there to do dental business, and so take care of his own branch of the profession. He did not wish the council to put itself in opposition to a claim which was based on justice.

SIR JOHN SIMON said he had not the slightest objection to the Executive Committee getting any assistance from members of the dental profession, but if the Council acceded to the introduction of one class of practitioners, they would have to introduce a host of others. Why should they give more distinction to a Dental practitioner than to any other?

SIR W. FOSTER replied that other practitioners were represented as members of the Medical profession. A man who was a pure dentist had a right to be represented when Dental business was transacted. He thought so and he believed it would come to that.

Dr. Glover agreed with Sir Walter Foster that the Resolution should be so framed as not to commit the Council to any hostile opinion with regard to the rights of dentists.

The Resolution was then amended as follows:—

"That with regard to the communication from the British Dental Association, in which it is suggested that one or more Dental representatives be added to the Council, the Council believes that it has no legal power to adopt this suggestion." This was put to the Council and agreed to.

ADVERTISING DENTISTS.

Mr. Brudenell Carter said Sir John Simon had suggested a slight alteration in the words of the Resolution, of which he had given notice, and with which for the most part he thoroughly agreed. He said the original motion was calculated to commit the Council before hand to a course of action. If therefore they could steer clear of committing the Council to a course of action they would no doubt be safe. He would move "That the attention of the Council having been called to the practice of advertising by certain dentists, it is hereby resolved that the issue of advertisements of an objectionable character, and especially of such as contain either claims of superiority over other practitioners, or depreciation of them, may easily be carried so far as to constitute infamous or disgraceful conduct in a professional respect." He had inserted the words, "of an objectionable character," because they might have an advertisement of an objectionable character, which was yet not carried so far as to constitute infamous conduct. He did not wish to limit the class to advertisements claiming superiority over, or depreciating other practitioners.

Sir Dyce Duckworth seconded the motion.

Sir W. Turner asked whether under the term "advertisements" Mr. Carter included large placards and other notices posted on the front of a house?

Mr. Carter said that was his intention. It would be for the Council to consider whether they were objectionable advertisements. He proposed if the Resolution was adopted to move that the advertisements of which specimens were exhibited should be referred to the Dental Committee to consider whether they constitute a case against anyone.

The Resolution was carried.

It was moved by Mr. Carter, seconded by Dr. McAlister, and resolved "that the foregoing Resolution was communicated to the Medical and Dental Journals, and to the authorities of recognised Schools of Dentistry."

Mr. Carter moved "That the Dentist's advertisements now exhibited to the Council be referred to the Dental Committee on penal cases for their consideration."

Dr. MacAlister seconded.

Sir William Turner thought that opportunity should be given for the withdrawal of the objectionable advertisements.

Mr. Carter saw no reason why the Committee should not look into the matter of standing advertisements, and to come to some general conclusion as to the course to be adopted.

Sir William Turner thought this was a motion which could not be passed on that occasion.

Dr. Glover urged that these gentlemen were entitled to the benefit of notice.

Mr. Carter said he did not intend to deprive them of the benefit of notice. He only wanted the Dental Committee to look at these things, and perhaps to preserve them for any future use and reference, to classify and analyse them, and see their special merits or demerits.

The motion was negatived.

This concluded the business.

APPOINTMENT.

Mr. J. W. Pare, M.D. Edin., C.M., L.D.S., Eng., has been appointed Demonstrator to the National Dental Hospital.

VACANCY.

The post of House Surgeon at the National Dental Hospital is vacant. Applications to the Secretary by the 15th inst.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the British Journal of Dental Science.

GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION OF THE UNITED KINGDOM.

299, Oxford Street, London, W.,
May 30, 1894.

Sir,—By order of the General Medical Council, I am directed to communicate to you the following Resolution, passed by the Council on May 28th, with a request that you will call attention to it by some leading article or otherwise, in a prominent position in your Journal :—

> "That the attention of the Council having been called to the practice of advertising by certain Dentists, it is hereby resolved that the issue of advertisements of an objectionable character, and especially of such as contain either claims of superiority over other Practitioners, or depreciation of them, may easily be carried so far as to constitute infamous or disgraceful conduct in a professionel respect."

Yours faithfully,
W. J. C. MILLER.
Registrar.

British Journal of Dental Science.

No. 634. LONDON, JUNE 15th, 1894. Vol. XXXVII.

THE RELATION BETWEEN AFFECTIONS OF THE TEETH AND OF THE EYES.

By Dr. N. Feuer, (of Budapest).

Translated by Sydney Stephenson, M.B., Surgeon to the Ophthalmic School, Hanwell, W.

(*Continued from page* 491.)

Decaisne[46] described a whole budget of eye diseases, which, according to him, were the result of dental affections. He also imposed the name "*dents oculaires*," not only upon the canine, but also upon the first molars, because of their alleged extraordinary influence upon the eyes. Decaisne relates an instance of the formation of cataract in a soldier, 21 years of age. As a sequel to extraction of a molar, an abscess made its appearance, which healed after four months treatment, leaving behind it, however, two scars upon the chin, which were firmly adherent to the adjacent bone. Later on, capsulo-lenticular cataract was discovered, which, if we may believe the soldier's statement, had developed during the after-treatment following removal of the tooth. The eye, it may be noted, was normal in all other respects. The soldier was discharged from the army by reason of his defective eye, and the serious scientific question of causation was regarded as solved by his statement.

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[46] Decaisne. Bull de l'acad. royale de Belg., 1853, Bd. xiii., p. 53.

Henry Sewill [47] and Power refer to a case of cataract, believed to be due to dental irritation. Extraction of all the teeth (which was carried out by degrees), did not, however, hinder the further development of the disease.

OPTIC NERVE AND RETINA.

Apart from optic atrophy as a sequel of retro-bulbar inflammation, anatomical changes in the nerve or retina have been recorded once only, by Gill, [48] who noted effusion into the latter structure, along with obscured arteries. This case, in which the anatomical condition of the retina does not appear to have been ascertained beyond all doubt, belongs, in our opinion, to the class of pure amblyopiæ, to which we shall refer hereafter.

In order to render this section complete, the fact must be mentioned that Guaglino [49] professes to have observed detachment of the retina as a consequence of disease in the teeth and gums.

II. Sub-Group: FUNCTIONAL DERANGEMENTS

Even were we in a position to reject, *a priori*, the theory of reflex inflammation, yet we are bound to consider each theoretical argument in dealing with the mysterious region of neurology concerned with true functional disturbances. The knowledge that irritation proceeding from the intestine (helminthiasis) and from the genital organs (uterus) can summon into existence, reflexly, functional derangements of the eye, will prepare us to believe that dental irritation may have a similar effect.

Apart from the already-mentioned over-secretion of tears, the functional derangements may be regarded as examples of irradiation into (*a*) the optic nerve and retina, (*b*) the oculomotor nerve, and (*c*) the facial nerve.

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[47] Sewill. Odont. Gesellsch. von Gr. Britain, 1868, & 1883, (5 Nov., Deutsche Monats. für Zahnheilk, 1884, p. 347.

[48] Gill. St. Louis Med. Journal, 1873, p. 301, & Deutsche Niertel-Jahrsschrift für Zahnheilk, 1873, p. 422.

[49] Guaglino. Trattato delle Malattia interna dell'ochio, Milano, 1858, (see Croniceneau in Arkoy. Diagnostik der Zahnkrankheiten, 1885, p. 363. The original not available.)

(*a*) OPTIC NERVE AND RETINA.

Disturbances of the optic nerve and retina as a consequence of dental irritation have been vaguely described by the majority of authors as examples of "amblyopia," or of "amaurosis," without more precise details as to their essential nature. Indeed, information concerning the fields of vision, the colour perception, and, in many cases, the sharpness of sight even is conspicuous by its absence. Still, the loss of sight was often described as extreme, and in not a few instances amaurosis was stated to have been present. If we except certain cases where hyperæmia (the existence of which must be always regarded as problematical) was alleged to be present, the results of ophthalmoscopic examination were uniformly negative. The dental irritation (from caries or from roots sensitive to pressure only) was frequently of so trivial a nature that the patient was actually unaware of its existence. In a few cases, dulness of sight ensued rapidly after extraction of a tooth ; in others, defective vision quickly disappeared after removal of painful or suspicious teeth. Clearly, then, one must first enquire whether hysteria or simulation, cured by the extraction of a few teeth, was not present in the latter case ; whether amblyopia following extraction of teeth might be in the nature of a traumatic neurosis*. In this connection it is interesting to note that the majority of patients were either women or children, who are prone (from various causes, such as deceit, epilepsy, desire for sympathy, and so forth,) to simulate ailments with great nicety. Eros [50] reports fourteen examples of simulated disease in children, of which we may quote the last :

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* In my experience, instances of traumatic neurosis are not uncommon, at least among children. The following typical case came under my notice some short time ago. W. W., 12 years of age, knocked his right eye against a bedstead. When I examined the lad, some two years later, tonic spasm of the right orbicularis palpebrarum muscle was present, and the history was to the effect that, with occasional remissions, the eye had been tightly closed ever since the accident. On separating the lids forcibly, the eye was found to be free from redness or other morbid change. The treatment

A girl, six years of age, was struck upon the left eye by her teacher, whereupon that organ became inflamed, and after the redness had disappeared, remained blind. Beyond an oblong scar upon the cornea, which could not materially interfere with sight, there was no discoverable disease. The tender age of the child seemed to be against simulation. Vidor, the ophthalmic surgeon to the Stephanie Children's Hospital, at Budapest, managed the case as follows. After the right eye had been bandaged, Vidor placed the child at the end of the room, then, stationing himself a few paces away, told her to come to him. The child followed the voice and took a few steps straight forwards. At that moment, however, Vidor stepped lightly aside. The child started, and remained standing and confused. As the suspicion of simulation was strengthened by the foregoing experiment, Vidor made further tests. The right eye being bandaged as before, he pretended that he was about to puncture the supposed blind eye with a lancet. The child appeared to have been prepared for this ; neither a wink nor a movement of the head betrayed fear of the thrust ; a slight trembling of the knees was the only sign that disclosed her agitation. The patient

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was as simple as it was effective : the patient was told to open the eye, and to keep it open, a mandate that he immediately obeyed.

Now supposing that, instead of a mere psychical suggestion, one or more of the carious teeth which were actually present had been extracted, it is quite likely that a similar result would have followed ; in which event, another would have been added to the long list of cases assumed to be due to a dental reflex.—Trans.

[50] Eros. "Concerning Simulated Diseases in Children." Jahrbuch für kinderheilkunde, 1884, p. 373.

was next subjected to ophthalmoscopic examination for a considerable time. Then a glass, *plus* 80, was held before her, and the child began to read the letters of Jaeger No. 1. continuing to do so even after the lens had been imperceptibly withdrawn from before her eye.*At this stage it was discovered that the child had been instructed to simulate blindness by her mother, so as to embarass the teacher.

Before embarking upon a critical examination of some of the recorded cases, it will clear the ground if we specify certain sources of fallacy. In the first place, it is obvious that we cannot expect a patient suffering from spasm of the orbicularis and photophobia to attain full acuteness of sight ; nor can we, with any show of reason, describe such a patient in such a condition as amblyopic. Secondly, ophthalmoscopic examination can be only partially carried out under such circumstances. Thirdly, as regards the field of vision, a healthy person not infrequently shows considerable differences between the results obtained by the perimeter on different occasions. Fourthly, as tests of sight are not always conducted by specialists, it may be pointed out that patients with catarrh of the conjunctiva—which, as we have already seen, is so common in painful diseases of the teeth—often complain of disturbance of sight, and are persuaded only with difficulty to read the test-types to their end.

Besides, apart from such subjective complaints, conjunctivitis may give rise to considerable though transient disturbance of sight, due partly to the increased lacrymation and partly to the countless morsels of mucus that cover the cornea.† Gill[48] quotes, in all seriousness, a case from the *Revue de Therap. medico-chir.*, where obstinate catarrh of the eyes and photophobia came on as a sequel to dental irritation. After removal of decayed teeth, the patient was astonished " to be able to see with his eyes." (Compare with Hutchinson's first case, quoted later.)

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* The reader must bear in mind that the right eye was still bandaged during the time that the glass (plus O· 5 D. sph., in modern notation)was held in front of the left eye. That is to say, the child was able to read the smallest type with the latter eye, with or without a glass, notwithstanding the fact that she alleged it to be blind.—Trans.

† Wells (*Diseases of the Eye*, 1869, p. 19), has given an excellent account of the disturbances of sight that are met with in Catarrhal Ophthalmia. ' Vision is only so far affected," he says, " that objects may appear somewhat hazy and

If we exclude from the mass of recorded cases those that present such obvious fallacies as the above, we shall find comparatively few remaining pertinent to the present enquiry. The limited space at our disposal, moreover, precludes mention of more than a tithe of the numerous communications that have been published on this subject.

Most authors quote the dictum of Beer[51]: " Among the rarest causes of amaurotic feebleness of sight, we must include a consensual neurosis of the eye, due to a decayed molar tooth of the upper jaw" ; and they instance his statements about amaurosis following wounds of the eyebrow as proof that such a thing as reflex blindness really exists.*

A still earlier author, Richter,[52] narrates the history of a lady who, after blindness of some years' duration, recovered her sight, though for a few seconds only, upon a tooth being

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indistinct, as if seen through ground glass, which is due to the presence of a little of the discharge upon the cornea. The patients also notice muscæ volitantes in the shape of strings of fine beads floating through the field of vision, these are produced by mucus and little flakes of epithelium being washed over the cornea by the movements of the eyelids. For the same reason, the flame of a candle appears to be surrounded by a coloured ring, which, however, also disappears when the lids are rubbed."—Trans.

[51] Beer. Lehre von den Augenkrankheiten, 1817, B. ii., p. 452.

[52] Richter. Anfangsgv. der Wundarzneikunst, 1795, Bd. iii., p. 428.

* It is an ancient belief that wounds of the eyebrow and eyelids may give rise to amaurosis. It was held that blindness resulted from reflex irritation proceeding from branches of the fifth nerve distributed to the injured parts. Beer (*Lehre von den Augenkr.*, 1813, v. 1), was one of the principal advocates of this theory, and he recommended, as a means of cure, a section of the nerve supposed to be implicated. Modern pathological research has shown, however, that the amaurosis is due in reality to fracture of the cranial bones and injury of the optic nerve.—Trans.

drawn. It seems almost a pity to be compelled to point out that such hallucinations not uncommonly occur without any extraction of the teeth. Gill (l. c. p. 430), thus quotes the foregoing case: "A lady, several years blind, recovered the power of vision a short time after the extraction of a decayed tooth."

Caffe [53] communicated the following extraordinary case:—A lady possessed a carious upper molar. Whenever food collected in the cavity of this tooth, the corresponding eye immediately became amaurotic, a condition which disappeared as soon as the offending particle was removed.

Sir Thomas Watson [54] records the following story of a doctor's son, who lost the sight of one eye two or three times in succession, without it being possible to discover morbid changes in the organ. Upon each occasion the loss of sight disappeared after the removal of teeth, an operation rendered necessary by their irregular disposition. Dr. Ashburner's opinion is quoted to the effect that such cases are not uncommon. (!)

Hancock [55] records the following instance of amaurosis: A lad, eleven years of age, discovered, upon awaking one morning, that he was completely blind. A month later, the patient was taken to the Royal Westminster Ophthalmic Hospital. His pupils were then dilated, fixed, and insensitive to light, and it was found, upon examination, that his teeth were much crowded together, the maxilla being too narrow to contain them properly. Accordingly, a dentist, who was called into consultation, removed six molars—two permanent and four temporary. On that evening, the lad could distinquish light from darkness, and next day could recognise objects. After that, sight returned so quickly that the patient was discharged cured eleven days later. The entire treatment, excluding extraction, had consisted of two doses of aperient medicine.

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[53] Caffe. La lancette franc., 1839, p. 94.

[54] Watson. London Med. Gazette, Feby. 5, 1841. (Mentioned, also, in Watson's Lectures, Vol. 1, p. 344, 3rd ed. Trans).

[55] Hancock. The Lancet, 1859, Vol. i, p. 80.

Mackenzie[56] published a batch of striking cases of this kind, culled from his own experience and from that of others.*

(*To be continued.*)

CROWN-WORK.†

By Mr. W. Bruce Hepburn.

Mr. Chairman and Gentlemen,—The subject which I wish to place before you for your consideration to-night, is that branch of our work known as "crown work."

The subject, I hope, will interest most of you, as this branch of work appears to be increasing and becoming more generally practised than it has been in former times. Most of you doubtless, will have had some experience in crown work, a fact which will enable you to be all the more capable of discussing the subject with me, which I invite all of you to do, as by so doing, it may lead us to improve on our every day methods of preparation and adjustment, by adopting what we may consider a more improved and speedier style of work than we have been in the habit of pursuing.

Those of you who have never practised the preparation of roots in the mouth for crowns, or even the construction of the crowns themselves, will I hope, if I may be permitted to say, be in a fitter condition to preserve roots under this treatment, which I am only too sorry to say are otherwise extracted.

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[56] Mackenzie. Traité prat. des maladies des l'œil. Trad. par Warlomont et Testelin 1857, Bd. ii., p. 845.

* The English reader will find these cases described in the fourth edition of Mackenzie's "Diseases of the Eye," pp. 1077—78.—Trans.

† Read before the Dental Students' Society of Glasgow.

Doubtless many of you consider the root preparation and mounting implies too much trouble and time, which in a sense cannot be denied, but as far as I can conceive such objections should be considered as quite a secondary matter.

You are all perfectly well aware that a Dental surgeon's true position is to save from decay as many teeth as possible, and sacrifice only those which are absolutely beyond his skill to save, a fact which to all appearances seems to be somewhat overlooked.

To attain the end I have in view, it is almost necessary for me to treat shortly on the preparation of the roots as far as is necessary for their adaptation to the crowns. It is needless for me to say, that to treat upon the roots, let it be ever so briefly, would afford adequate material for another such paper by itself, therefore I will only treat as far as is absolutely essential.

I shall therefore commence with taking into consideration first of all, the roots which are not suitable, and secondly those roots which are suitable for this mode of treatment.

In the first instance, roots which are permeated or softened by decay, exposed or loosened from absorption of the gums and alveoli, or affected with irremediable disease of the investing membrane are not suitable for treatment.

Again, cases in which abscess with necrosis has extensively impaired the alveoli are equally unsuitable, therefore to obtain satisfactory results the roots must of necessity be in a thoroughly healthy and firm condition. Next to be considered is the treatment which the root must undergo during preparation. Should the root under treatment contain the pulp in a healthy condition, the pulp must be destroyed either immediately, or by the application of an escharotic, such as arsenic. Some surgeons prefer the extraction of the pulp to be executed under the effects of nitrous oxide gas, in which case the pulp may be extracted without much waste of time, besides saving the patient from what may be considered unnecessary pain and annoyance.

Should the root under treatment contain the pulp in a diseased condition, or, as is found in some instances, an empty pulp chamber, the treatment consists principally in adopting the following course:—

First of all in the thorough removal of the contents of the canal.

Secondly, in the disinfection of the root canals and the dentine, with the establishment of permanent aseptic conditions by the mummification of the contents of the tubuli.

Thirdly, by the closure of the apical foramen.

I shall now take into consideration the shape or form which the roots should assume.

The general principle of shaping the root consists generally in removing the approximal surface straight from the cervical border to the occluding surface, the corners being then carefully rounded.

The cervical portion which includes the junction of the dentine and enamel is trimmed so that the sides are level and parallel with the line of the root.

This, gentlemen, includes as much of the general principle of the preparation of roots as far as I need detail, with the exception, of course, of those roots which are to be treated with what are known as the Richmond and "all gold" crowns, in which cases as much as possible of the root surface should be preserved, as by so doing, the root surface acts as a foundation or anchorage for the collars or ferrules of each of the above mentioned crowns.

All these points being attended to, the next step to be considered is the style of crowns most suitable for the different roots in the mouth.

To commence with, I shall treat upon those crowns most suitable for the incisor teeth.

I shall first consider the porcelain crown fixed in the root with a wooden post and a solution of chloro-percha. This crown is frequently made use of, but the principle objections urged against it are, in the fixing, the root is apt to be weakened, and besides this the crown in itself is inclined to be weak. In cases where the roots are badly diseased, and require a considerable amount of treatment, this style may be used with advantage as a temporary crown.

Another style is the crown with a porcelain front, backed with vulcanite and fixed in the root with a gold post.

This crown appears to be very seldom made use of, so that I cannot venture to say much about it.

In cases where the bite will allow, tube teeth may be snerted to advantage, as in bicuspids and molars, but with incisors the bite will in most cases be found too close to allow of a sufficient length of wire being allowed to stand above the cervical margin for strength.

In such a case as this, flat teeth will be found most suitable when it will be found necessary to first fit a piece of gold or platinum, thin plate over the root just sufficient to cover it, which can generally be accomplished with a pair of pliers, or if the plate be thin enough, burnished over the root. The position of the root canal being taken, a hole is punched or drilled in the plate to receive the pivoting wire. The wire is then soldered to the plate, the tooth fitted, backed and the whole crown soldered with very fine solder.

This crown, well known amongst you, is quickly made, easy to adjust, and may be made to suit the size and strength of the root under treatment.

Another form of pivot much practised in England consists first, in enlarging the root canal to about one eighth of an inch in diameter, then inserting a hollow tube of gold or platinum made to grasp the wire to be used as the pivot tightly, to accomplish which, it may be drawn through a draw plate enclosed with the wire.

The tube is then slightly barbed, and fixed in the root with amalgam or Weston's cement, and then allowed to thoroughly set, when a piece of the necessary standard thickness of wire should be inserted into the tube, a small piece projecting to catch in the impression material. The impression is then taken and cast : remove the pin carefully and fit a piece of plate over the root as in the former mentioned case. The mode of procedure is now the same as in the former case, except that the pin is split before soldering to the plate. When finished, the ends of the wire are separated at the neck of the tooth to obtain a spring; when the free ends of the wire should be pressed together to enable them to enter the canal. The tooth is then forced home, and retained in position by the split pivot.

I shall next mention the "Logan" crown, that is the porcelain crown with the post baked into it. This form appears to be frequently made use of by most crown practitioners, and upon the whole appears to be very satisfactory.

Next is the Bonwill crown. This is a porcelain countersunk crown, with the post fixed in the root with amalgam. This crown is also frequently used, but besides being a little difficult to fix, the amalgam is apt to discolour the root margin if subsequently exposed and is inclined to be disfiguring, otherwise the crown is very satisfactory.

Lastly to be considered, is the Richmond crown with porcelain front and collar or ferrule attachment. This crown has also been proved satisfactory.

Next to be considered are the crowns most suitable for the bicuspids and molar teeth.

The Logan crown is inclined to be a little difficult to fix owing to the number of pins required. In the case of the bicuspid teeth, should the roct possess a single tooth this crown stands good, otherwise is inclined to be weak.

The Bonwill crown is also a little difficult to fix ; otherwise it is very satisfactory.

The Richmond Crown is perhaps the most suitable where a porcelain front is desired.

The crown known as the "all gold" crown is exceptionally good, as in cases of molars or second bicuspids, which are not noticeable. It is upheld by many as being superior to all other crowns. It is stronger, cleaner, and can be well adapted for mastification purposes. In the turning of the bands for the Richmond and "all gold" crowns it is advisable to fit the ferrules to the roots in the mouth, as you will find if you have not done so already, that you will have more satisfactory results, more speedily accomplished, and less prone to accidents compared with the general principle of fitting them to the cast.

With your permission, gentlemen, I will conclude this paper by reading to you a synopsis of what Evans, one of our greatest authorities, in his treatise on the subject considers to be the principle objections urged against the use of porcelain crowns.

"Porcelain crowns have some decided advantages. They are especially useful in many cases where an inexpensive or easily adjusted crown is required, or where some pathological condition limits the probable durability or permanency of any operation. In the insertion of porcelain crowns the removal of the whole or of part of the natural crown which could be utilized to some extent as a foundation by other systems has given rise to various objections. If the natural crown is entirely cut away, the pin or post upon which almost the entire support of the artificial crown is thrown, acts like a lever in the root canal, there being no band or brace to relieve the strain. With the whole force of mastication bearing directly upon these pulpless roots, whose disintegration is slowly but constantly progressing, the inevitable result can be well conjectured. Sooner or later they are fractured, and their usefulness as a foundation ended. Then again if the porcelain crowns are attached with amalgam the discolouration of the line of union with the root if subsequently exposed is disfiguring. These facts and the lack of strength incident to some forms of construction are the principle objections urged against crowns as ordinarily inserted.

This may be said of crowns in general. In the cases of crowns with ferrule attachment, this can to a certain extent be avoided, by the fact that the ferrule protects the neck of the root from the constant secretion in the mouth. This, together with the fact that a porcelain front can be obtained as well as the pivot pin and ferrule are about the principle advantages obtained through the insertion of the Richmond crown."

Many dentists are under the impression that the Donaldson bristles are made for the sole purpose of extracting the nerve. A nerve broach is better adapted for that purpose. A Donaldson bristle is a series of knife blades, which is twisted into the nerve-canal and cuts the pulp into a mass of small pieces. In withdrawing, it is apt to leave what it has forced before it in the canal. A nerve broach, if adapted to the canal—in other words, is fine enough at the point to pass freely up almost the entire length of the canal, if given a half or not more than a three-quarters turn, will entwine the nerve around the instrument, and in withdrawing the broach you have the nerve.

Items.

British Journal of Dental Science.

LONDON, JUNE 15th, 1894.

ADVERTISING.

We willingly accede to the request of the General Medical Council, conveyed through the Registrar, that we should draw attention to the Resolution passed at the last session. To most of our readers, no doubt, it is unnecessary to recapitulate the terms, as it was published in full, with the other dental proceedings, in our last issue, and presented perhaps the most important item of news. The Council resolved that the issue of advertisements of an objectionable character may easily be carried so far as to constitute infamous conduct in a professional respect. It is to be observed that the resolution, as it stands, is merely an expression of opinion; indeed it was distinctly understood that it did not commit the Council to any course of action. For some reason or another it is thus left to tell to the outside reader its own tale; and if it is to be accepted in the light of a warning, we must infer that a bald statement of opinion is sufficient, when emanating from such a weighty authority, to conjure up the corollary of pains and penalties which, to save unnecessary unpleasantness, need not be further alluded to.

Some of the practitioners who are thus personally affected will have closely watched the progress of events, and in order to form some idea as to their position, it is interesting for both "guilty" and "innocent" ones, (who are also,although indirectly, concerned)to make a comparison as to the attitude of the Council now, and at six months ago. It may be remembered that Mr. Brudenell Carter's original motion upon the question of dental advertising, which was submitted to the Council last December, was not accepted, but referred back to the Executive Committee for submission to the legal advisers of the Council. The wording of that motion showed that the issue of certain advertisements would be regarded as an offence with which the Council "will be prepared to deal." There could not be much misunderstanding as to what this meant, and in commenting upon the subject we pointed out that if the Council found itself able to restrict dental advertising to a mere mention of name and address, it would place the dental profession on a higher level than that attained in general medical practice.

We need not travel over all the ground again. The broad question of advertising has so recently, and so excellently, been dealt with, incidentally, in an address by Mr. CHARLES TOMES, whose remarks our readers had an opportunity of perusing, as to leave little to be said. The commercial man advertises an article; the professional man, if he attempts to follow such methods, must extol himself. Essentially, he cannot waste money in announcing that he is only as skilful and honourable as his fellow-practitioners. Nothing will content him but a claim that he is better and that they are, at least inferentially, worse. It is this course of conduct which the GENERAL MEDICAL COUNCIL condemns; but Mr. CARTER expressly pointed out that it would be for the Council to consider what could otherwise be included under the term "objectionable advertisements." The same speaker also wished that the specimens of advertisements which, presumably, had stimulated the Council to their minatory action, should be referred to the Dental Committee on penal cases, to consider whether they constituted a case against any one. This, however, was negatived, and we must remain content to await developments and to see whether it is possible to add force, if necessary, to the resolution. We can scarcely expect, much as it may be wished, that no case will arise for consideration. Until the matter has been tested, the advertising dentist will not be content to restrict his announcement to that of his name and address. At present the principal representative body of British Dentists allows the publication of "a card," whilst The Royal College of Surgeons in Ireland, we believe, regards even this as an advertisement. It is time there should be some consensus of opinion on such a matter if possible. We say "if possible," for ethical questions are proverbially difficult. We may at all events expect an interesting debate in the Council before long, when it becomes necessary to take votes as to what is, and what is not, to be allowed.

PEMPHIGUS FOLIACEUS.—This disease is marked by the formation of large bullæ, or blisters, occurring on the skin of all parts of the body. It is sometimes accompanied by aphthæ and vesicles on various mucous surfaces, and Mr. C. F. Cuthbert now records a case in which this condition occurred early in the course of the disease. There were aphthæ on and under the tongue, and on the mucous membrane of the mouth and pharynx. There was considerable swelling of the lips and tongue, salivation, and fœtor. Boro-glyceride was prescribed to wash out the mouth and throat frequently, and a chlorate of potash mixture. Later, charcoal was dusted into the mouth, with the occasional use of iodoform locally. The lips had become so swollen and painful that the taking of nourishment was most distressing, and the body was largely covered by intensely irritable and painful bullæ. Constant diarrhœa set in, followed by exhaustion and death, after an illness of about six months. Hebra is quoted to the effect that the disease is peculiarly malignant, extremely rare, always fatal, and, as in this case, more common in women.

A TUMOUR OF THE LOWER JAW.—An interesting case is recorded in the *British Medical Journal* in which Chloride of Ethyl was used as a spray for anæsthetising the superficial parts during operation. The patient was a feeble, anæmic black woman, and the tumour nearly filled the mouth. Under the spray an incision was made from the chin to the angle, and the facial artery ligatured. The incision was subsequently extended upwards to just below the centre of the lower lip, and to the ear, but the patient showed no sign of pain. Ether was next administered and the bone divided at the symphysis, cleared of the tissues, and disarticulated. Dr. W. J. Branch thinks that the local anæsthetic and preliminary ligature of the artery are especially useful in such an operation on debilitated subjects. Two molar teeth were found to be embedded in the internal part of the tumour, and the case reminds us of instances of "dentigerous cyst," where a preliminary incision into the substance has sometimes resulted in the saving of the jaw.

Acromegaly.—Dr. Middleton when showing a typical case of this disease at Glasgow, described the dental points as follows :—The patient was forty-nine years of age. "His face is much lengthened, its most striking feature being the projection of the lower jaw, and the protrusion of the lower lip. As tested by the incisor teeth, the lower jaw protrudes one inch beyond the upper one, but this applies only to the anterior portion, as the upper and lower jaws very nearly correspond in their lateral portions. The central portion of the body of the jaw iis deepened, but the lateral portions of the body are somewhat shallow. The angle of the jaw is unduly obtuse. The superior maxilla is not enlarged, its alveolar margin is much atrophied. He has had a great many teeth extracted, having been a sufferer from toothache for thirty years. Among other teeth remaining are the lower central incisors, and these are separated from each other by a wedge-shaped interval. None of the teeth are hypertrophied." We think we remember other cases where the note is made that the teeth themselves are not hypertrophied. Remembering their mode of calcification it is difficult to imagine how an increase in size could well take place, excluding, of course, the root which is out of sight, and might certainly be exostosed. Other points for dental criticism would be the systematic extraction for toothache, and consequent "atrophy" of the alveolus.

A "Covering" Problem.—A correspondent writes to the *British Medical Journal* for an expression of opinion as to whether a medical man is acting rightly in giving an anæsthetic to one of his own patients for an unqualified dentist to extract teeth. Does he render himself liable to a charge of covering? The reply given is to the effect that no such case has yet been brought before the Council. Assuming that the correspondent means by the use of the word "unqualified" that the dentist is "unregistered," it then becomes a question whether the extractor of the teeth is acting as an assistant to the medical man, or whether by the latter's co-operation, the unregistered man is enabled to pose, operate, and claim a fee as if he were duly registered. We notice that in several parts of the country, dentists are attempting to educate medical men upon this very subject. Sometimes, however, as came out in a recent case, the unregistered man feels able to dispense with the services of a medical man, and is his own anæsthetist.

The Sale of Practices.—A case recently decided in the Westminster County Court is of some interest to our readers. An Association which conducts the ordinary transfer business, sued a medical man for commission for the sale of his practice. Plaintiffs received instructions for the sale, and found some one who agreed to acquire the practice, but the defendant then declined to sell, saying he was in negotiation with someone else. It was argued that as plaintiffs found a willing purchaser at the price named, they were entitled to the commission. For the defence it was urged that the commission was not earned on the terms made with the plaintiffs. The judge said it was no doubt hard upon the doctor, but he must find for the plaintiffs for the full amount claimed, £32, and costs.

THE EYES AND THE TEETH.—The numerous instances recorded in which some abnormal state of the teeth is suspected of being the cause of eye mischief, do not seem to meet with the acquiescence of oculists. It would appear as if dentists were too much inclined to discover a causal relationship between coincident conditions. The matter has more than once been discussed at the Odontological Society, and on the last occasion several of the strongest cases were severely criticised. The series of papers by Dr. Feuer, now drawing to conclusion, which we are publishing, fairly covers the whole ground, and taken collectively will afford a valuable means of reference to those who may meet with cases in which diseases of the eyes and teeth appear associated.

DENTISTRY IN FRANCE.—Foreigners who wish to practise dentistry in France, will in the future, have to pass the ordinary examinations and obtain the diploma of dental surgeon. Those who were already practising on Jannary 1st. 1892, will benefit by the transitory arrangements provided under the new law. The condition of things is much the same as when our Dentists' Act was passed. We are also reminded of the time when old practitioners came up to take the newly instituted diploma at the College of Surgeons. At present a similar class of men in France, are furbishing up whatever they knew of anatomy, and kindred subjects. The series of examinations for the diploma commenced last month at the Faculty of Medicine in Paris, and the majority of the candidates were provincial dentists. A selection from the questions asked shows the field is tolerably wide, so extensive even, as to include the comparative anatomy of the generative organs !

Abstracts of British & Foreign Journals

THE RELATION OF DENTAL CARIES TO CERTAIN FORMS OF INDIGESTION.

By E. F. Wilson, M.D., Columbus.

Nature recognises the fact that the stomach is not able, by itself, to digest any but the most easily assimilated food, so she furnishes the young child milk, and a milk that does not form a hard curd, but is more of a flocculent mass and very easily taken up and digested. As the teeth begin to come the salivary glands also begin to develop and prepare their secretion to assist in the digestion of mixed foods that the child is now ready for. In a large per cent. of children the teeth are not perfect and decay begins soon after they are erupted. Whenever this happens, almost without exception, the child will develop some one of the various symptoms that accompany digestive troubles in children. Until very recently the general practitioner of medicine has not attached much importance to the decay and loss of deciduous teeth, and almost nothing has been done to encourage their preservation until such time as the permanent set is erupted.

The teeth stand at the entrance or gate of the body, and their chief duties are the mechanical part of digestion. If the teeth are imperfect or decayed, the mastication of the food is imperfect. Instead of going to the stomach in fit condition to be acted on by the digestive ferments, it is more nearly in the condition of the food of birds, that have no teeth, but are supplied with a gizzard. Unfortunately in our make-up the gizzard was omitted, and the result is that if the teeth are not in condition to do this work properly and well, we suffer the pangs of indigestion, with all the sympathetic disorders that follow in its train. It is true that the evil effects of "bad teeth" are seen more frequently in childhood and in old age than at any other time of life. I am satisfied that in children a number of diseases may be traced to the carious condition of the teeth. Suppuration of the middle ear is caused again and again by a carious tooth. Disease of the eye is also caused by the condition of the teeth. Various neuralgias and reflex nervous symptoms arise from the same cause. Last, but by no means least of all, come the digestive troubles brought on by the carious teeth.

Have these things been regarded sufficiently in the past? How many of you, until within the past few years, have been called upon to treat and preserve the "milk teeth?" Was it not, rather, is it not the fashion to let them go, as they will not pay for being treated, they will be replaced so soon by the permanent teeth? This false economy has been responsible for a countless number of sickly, ill-nurtured children, who if they live to reach puberty make the nervous, dyspeptic men and women that are met in every walk in life, and that are pointed out by our English cousins when they say "Americans are a race of dyspeptics."

The art and science of dentistry has reached such a high plane that any neglect of the children's teeth in the future will be little less than criminal. It is also to be hoped that the time has come when the physician will realize his obligation to this matter and will have the children's teeth carefully examined and treated at least once in six months. In regard to older patients it is hardly necessary to say anything. It is recognized, both by the patient and physician as necessary for æsthetic as well as for hygienic reasons, that the teeth should be kept in repair. There are though a large per cent. of people, who on account of their finances, or for some other reason, neglect the teeth and shun the dentist. It is among this class that we find the digestive trouble caused by faulty mastication and fermentation.

The troubles caused by faulty mastication are entirely mechanical. Those of fermentation are still to be explained. Prof. Miller, of Berlin, says: "It has long been known that the human mouth was the abode of numerous microscopic organisms; but only within the last five or ten years, since more exact methods of bacteriological investigation have come into use, we have been able to acquire much definite knowledge as to the morphology, physiology, etc., of these minute organisms. Recently the study of the bacteria of the human mouth has been zealously pursued by various investigators, and much has been accomplished toward bringing to light the causes of various affections of the mouth and associate parts.

"There is no part of the human organism which furnishes a more universal culture medium for bacteria than the oral cavity, and the different varieties of micro-organisms that find in it conditions favourable to their development are correspondingly numerous. Of these the larger part are of a non-pathogenic character, existing upon the various organic substances in the oral secretions, and upon particles of food which have been allowed to remain between the teeth, but producing no particular deleterious effects upon the surrounding parts other than the decay of the teeth." Miller divides the oral bacteria into several classes, one of which is composed of a large number of bacteria that decompose sugar, forming lactic acid. It has been proved in the past few years, that decay is caused by a decalcification of the tooth substance, followed by a solution of the decalcified basis substance. The decalcification is brought about by acids, chiefly lactic acid; and these acids are produced by the action of micro-organisms on carbohydrates. The solution of the decalcified tooth substance is accomplished by the peptonizing power of the same or other micro-organisms. So much for the pathology of caries.

Can these micro-organisms be carried to other parts of the body and there do harm? James Israel describes a number of cases of abscess on the neck, chronic pyæmia, etc., which owed their origin to these organisms. That they are also able to produce both chronic and acute disturbances of digestion there can be no doubt. By the continual swallowing of the bacteria lodged in the mouth we have one of the most frequent causes of fermentation dyspepsia. It is now known that most of the bacteria found in the mouth may pass through the stomach without losing their vitality, and under certain circumstances may produce severe disturbances in the intestinal tract. So, now that the pathology of dental caries is better understood, the connection between the proper care of the teeth and some of the phenomena of indigestion are easily traced.

To us, as practitioners of medicine and dentistry and as practical men, all these things show only this: what an important field we have in the human mouth for investigation and study; and how much the general health depends on the proper care of the teeth.

The Dental Register.

A METHOD OF SECURING LOOSENED INCISORS.

By S. E. Davenport.

Dentists are occasionally called upon to treat mouths in which, while there is no particular tendency towards pyorrhea alveolaris, certain teeth, usually lower incisors, will be found very loose, the bony process much absorbed, and the gum thickened and spongy, with perhaps a slight exudation of pus. This condition in such mouths is usually of local origin, caused by the encroachment of salivary calculus, the other teeth in the mouth being ordinarily in very good condition and of unquestioned longevity, and it always seems sad to be obliged to advise the extraction of these loose teeth, particularly as it is difficult to replace them with artificial substitutes which shall be both comfortable and natural.

On one occasion the temptation to attempt the retention of such teeth was increased by the pleadings of the patient, a gentleman about seventy years of age, in good health and of good physique, who had more than the usual horror of artificial teeth, assuring me that he would bear any fatigue, put up with any discomfort if I would but save his natural teeth. The teeth had as usual elongated considerably, and when the jaws were closed, the four inferior incisors would sometimes shut inside and sometimes outside the upper ones, though the roots were long and still had quite an attachment to the gum.

The first step was to grind down the elongated teeth with corundum stones until they would clear the upper ones when closed. An impression was taken, and upon the dies obtained a cap of pure gold, about number 30, was swaged to fit the upper two-thirds of the lingual surfaces of the six teeth, and extending over the tops of the teeth to a point, perhaps, one-fourth of the distance down the labial surface. This cap, being carefully fitted, was cemented in place, June, 1891, with zinc phosphate, and the edges of the cap burnished to the teeth wherever possible. The teeth were then thoroughly scaled and cleaned.

This pure gold cap has become loose twice since it was first put on, but it is easily readjusted and has in every way fulfilled expectations, for the teeth are preserved, and I think, can be indefinitely. Such a contrivance would be unsightly in a lady's mouth, but this gentleman having a heavy moustache and beard, exhibits the golden line only when the joke is a particularly good one.

International.

ARSENIC AND THE DENTAL PULP.

In proof that it does not act by causing strangulation, at least, comes the evidence that the portion of the pulp the farthest from the apex, is the part that first perishes and becomes dead to sensation, whereas the portion the nearest the apex, is the part that the longest retains vitality, and is often highly sensitive long after the part that is the farthest away, and has been in actual contact with the poison, is even dead and decomposed, or partially so.

That arsenic will destroy the dental pulp is a well-established fact ; but that it does so by the process so commonly taught, and so widely believed, is an unsettled question, and needs to be solved. Until it is, and so settled that it can be demonstrated, the methods of its application will continue to vary, and the results following such application be numerous, and often unsatisfactory. In the light of scientific truth, a definite result should always follow a given course of treatment. That it does not, only proves that *unscientific* methods are followed, and this for want of proper knowledge as to the conditions to be met, and the right course to be pursued. So long as mystery hangs over or about any process that is to be carried out, so long will mistakes occur, definite ends fail to be reached, and blunders be made. When we can say we *know* how arsenic destroys living tissue, we may be able to take the next intelligent step and control the pain and discomfort, not to say danger and injury, that are now so often sequences of its use.

Until it can be definitely proved *just how* devitalization is caused, as in cases where we use it for pulp destruction, let us cease to teach or even *assume* that it is by strangulation, for the facts in the case will not warrant such teaching, nor will demonstration prove it.

W. H. H. Barker.

DISCRIMINATION IN THE USE OF FILLING-MATERIALS.

By Dr. CHARLES F. ALLAN, Newburgh N. Y.

The good dentist uses all the means and materials at his disposal. He finds them insufficient enough, and is continually wishing for more and something still better. The ideal filling material has never been discovered, and possibly never will be ; but to meet varying conditions and wants, many materials other than gold have been brought to our notice, differing in what we may call adaptability, for want of a better term, and differing also radically from gold in working qualities. By adaptability is meant that inherent relation between tooth-tissue and filling-material which would indicate what filling was best for the preservation of the tooth without reference to physical difficulties of insertion By working qualities, reference is made to the just mentioned "difficulties of insertion," and the expression has its main signification to us in noting the often great difficulties of the proper use of gold, as opposed to the easier manipulation of other materials.

Gold is the best filling-material. This as a broad general statement most will subscribe to ; but, like many another generalization, it is meaningless, and is at best only a half-truth. Unless the statement were dissected and explained, and the very numerous exceptions noted, it would very often convey an untruth

Gold is difficult and tedious of insertion, and its manner of introduction by the use of pressure and percussion is trying on the patient to such an extent that the inherent difficulties for large operations will frequently prevent its use. Gold in these cases may meet the claims of adaptability, and yet we are prevented from using it by fear of the physical and mental strain upon our patients. Very frequently the question is, not what is simply best from the standpoint of adaptability, but what is best considering the physical or mental infirmities of our patient. I would very rarely use gold in the teeth of children younger than ten years of age, and not very often in children of less than twelve or thirteen. It is very seldom that the teeth of young children are of dense and good enough structure to warrant its use, and occasionally when we feel that as regards adaptability it is right, we are interdicted by the serious strain, mental more than physical, we would impose on young constitutions.

Specialists we are indeed, but I hope in a broad sense. Very often we are called upon to temporize with some particularly bad tooth, for the sake of keeping a child's confidence and avoiding a child's dread of our profession. In a word, we are to temporize and postpone what is best for an individual tooth, that we may in the end save all the teeth. There is no better practice than this, however much sticklers for the best in all cases and extremists may exclaim.

Amalgams have a vast field of usefulness, though they are used much oftener than they should be, and very rarely with that care and attention to details necessary to accomplish the best results. No material calls for more careful management. Slovenly work invariably brings about bad results, and the material has had to bear more of the odium consequent upon faulty and reckless manipulation and lack of knowledge than any other material we are called upon to use. Employ it in its proper place, and with judgment and care in its insertion, and it will make a good record as a tooth saver.

I have said that it is used much too often ; this is my firm belief. With teeth of reasonably good structure in people who take care of their teeth, and who are willing and anxious to have the best work done, and have the physical stamina to stand the necessary strain, gold is the best material for approximal and crown work in the bicuspid and molar teeth, and it is a wrong impression frequently held, that such work done with amalgam will last better than gold. In a general way, the cases where I would use amalgam are as follows, and I will take my first class of cases from the opposite to what I have indicated for gold,—viz : where the physical strength to stand the necessary strain is lacking. Cases of physical and mental debility are continually coming under our charge where we would either not be allowed to use gold or where we would err from constitutional reasons. Though adaptability says gold, necessity says amalgam.

In back teeth of very bad structure, with cavities working well up under the gum, especially if there are old gold fillings that have failed, I would use amalgam, and where it is possible I would have the amalgam join on to a gold filling. In the small crown cavities of the temporary molars, I know of no better material than amalgam, and I would likewise use it very frequently for crown cavities in the first and second molars of children under twelve or thirteen. How amalgam should be used is hardly germane to this poper, though I would say that in the majority of cases I would use it in connection with one of the oxyphosphates.

By the use of the word amalgam so far, I have meant the material ordinarily so called, and have not included copper amalgam ; but I now wish to speak of this latter article, and to declare that even this certainly much-blackened and even maligned material has a place and a use, and that when used in its proper place it is very valuable. I have seen young patients within this month whose mouths have been to me a delight to look upon,—children with fragile, chalky teeth, with copper amalgam fillings in the buccal and lingual aspects of the lower molars, black as ink,but absolutely perfect in their integrity. I am free to admit that, on the whole, my experience with copper amalgam has been a disappointment, and in some ways a bitter one, and that my sanguine anticipations, born of a contagious enthusiasm, have not been fulfilled. Nevertheless, there is a place for it among our tooth-saving materials. I would rarely ever use it either in crown or approximal cavities, with the exception of the lower third molars. Occasionally, where those teeth are impacted in the bone of the angle of the jaw, only half erupted and more than half decayed with an operculum of gum covering half or more of the crown. to my mind there is no other filling half as good. I would also use it in the lower molars of children where they are of very poor structure, with cavities on the buccal or lingual faces. Another very excellent place for it is in repairing the damage done to a molar by an ill-fitting cap used as as an abutment for a bridge.

Generally speaking, it should never be used where it will be exposed to attrition, and it is of most use where all other filling materials are ineffective. I can but think that there is much of promise in copper amalgam ; that as yet we know but little of it, and that some day, with a modification of composition and preparation, it will yet come forward to fulfil our earliest expectations.

Gutta-percha, of various grades, high heat and low heat, and also the base-plate pink gutta-percha, are of the greatest value ; but the material is used so generally, its merits are so commonly recognized, and there is so little difference among dentists as to its value and and as to its position among filling materials, that I will not waste time discoursing of its merits. One use, however, of the pink gutta-percha I feel like noting, and that is its great value in that peculiar and unfortunate class of cases that occasionally come to us,—always of course from some other dentist,—where the teeth of young persons have been under the influence of regulating apparatus for some months, or possibly years, and are in effect melting away with white decay. Gold and ordinary amalgam are almost useless to even moderately retard the destruction, but pink gutta-percha, supplemented perhaps with copper amalgam for the back teeth in some of the worst cases, will help to tide over the evil day till time brings to our aid constitutional recuperative powers. Just as we have seen molar crowns used as abutments for bridge-work and covered with ill-fitting caps, waste and melt and practically come away with the caps, so do we see in some cases the same melting wasting process taking place after long continued regulating work,—the teeth straightened only to be destroyed. Do not for a moment take this to mean a condemnation by me, wholesale or otherwise, of regulating, for this is far from any purpose of this paper. "It is a condition, not a theory, that confronts us." Regulating work is but too often carried to an extreme, is ill-advised and ill carried out, and the teeth come to us for treatment. No sadder cases come to the dentist, and I am glad that we have in pink gutta-percha such a valuable aid.

The class of cements known generally as oxyphosphates or oxychlorides have a very wide field of usefulness though confined mainly by me to use as a substratum for gold or amalgam fillings. Oxychlorides have a special value with many operators as a temporary stopping for the purpose of relieving the often extreme pain of sensitive dentine, rendering its further and permanent excavation less painful. It is also used frequently for root filling, and by many it is thought to have great value for that purpose. In my own practice I seldom use the oxychlorides, though they have always a place in my cabinet.

Oxyphosphates, though, are a very necessary part of my equipment. It seems to me rarely wise to put in a very large gold or amalgam filling without first filling the cavity partially with oxyphosphate. It is invaluable in the first instance to control thermal shocks where gold is used; in the second place, it is invaluable by reason of its adaptability over a thin layer of dentine covering a nearly exposed pulp; and in the third place, it is of value because it restricts the amount of metal filling necessary. The greater amount of metal you have in a filling, the greater will be its expansion and contraction as a consequence of thermal changes. This point is not often referred to, but it is a very practical one, and is a factor important enough to be seriously considered, for it involves in many cases the future integrity of the most painfully and carefully constructed work. Of course when the metal filling is gold, the great saving of labour and time in the putting in of the filling is a matter of the utmost importance, and renders work possible to the patient in some cases where for physical reasons it would otherwise be impossible. In its use in connection with amalgam, a great point is gained in the avoidance of discoloration of the tooth. Substantially the only cases where I would use oxyphosphate by itself would be with middle-aged or elderly people, either in front or back teeth, where the teeth are wide apart, and where for reason the work must be of a temporary nature. I would also use it occasionally with the temporary teeth of children. To my mind it is a material that should be only used as a filling by itself where all surfaces of the filling are widely exposed, and it should never be used in approximal cavities of teeth close together. The various kinds of oxyphosphates differ in their qualities, and the same preparation differs with different packages and at different times, so that there is always an element of uncertainty inherent in the material, which necessarily militates against its use as a filling to be depended upon by itself.

Perhaps a class of cases calling for discrimination more than any other is that of eroded teeth, as seen generally in the mouths of middle-aged and elderly people, though this discrimination is frequently to be shown more in deciding as to whether the teeth are to be filled at all than as to the kind of filling. Generally speaking, with male patients, such erosions can best be filled with gold. The moustache helps to hide the glitter of the gold, and the filling is as a rule, much easier put in than an inlay. With our female patients though, especially where they are moderately young, and show their teeth and gums a great deal, an inlay, either of porcelain cut from a porcelain tooth or of glass-filling, will give a satisfaction to patient and operator that will amply pay you for any increased time and trouble you cannot charge for in money.

The glass-filling outfit, however is as yet very unsatisfactory. The glass in the tubes as furnished us bears no resemblance in colour to the colour indicated, and when you have moderately well matched the colour of your teeth, you have no cement of the right colour to cement it with. Cutting an inlay out of a porcelain tooth is very slow tedious work, but often gives great satisfaction especially if cut from an English tooth, which will allow of the inlay being polished after it is inserted. Occasionally the porcelain rods of Ash and Sons can be cut and inserted to great advantage, also the inlays made by The S.S. White Dental Manufacturing Company. The latter, however, cannot be polished.

Another class of cases where discrimination can be shown in favour of porcelain as against gold is that of broken front teeth. There is hardly a fracture of the cutting edge of the superior incisors and cuspids of importance enough to be filled at all, but what can be repaired by porcelain. This possibly may seem to some of you a strong statement, but it can readily be verified. To my mind, nothing is more inartistic, no class of work is a more glaring reproach to the æsthetic side of our professional life, than the frequent, almost constant displays of gold that we see in the mouths of otherwise good-looking people. In many cases such displays are unavoidable but in many cases they are protruded, and in all cases they are unfortunate.

The Dental Cosmos.

THERAPEUTICS OF WATER.

By A. W. Harlan, M.D., D.D.S., Chicago.

The proper exhibition of water in dental surgery limits it to the treatment of acute facial neuralgia, pericementitis, pyorrhœa alveolaris, or any acute swelling from fractures or erupting teeth.

The question for the dentist to decide is whether water should be applied hot or cold to relieve pain and swelling. In the control of hæmorrhage, hot water of a temperature between 140· F. and 157·F. has been found most efficient. If the temperature is raised much beyond this, the vaso-motor constrictors fail to act and in relaxation a new hemorrhage is set in. This is probably due to an excitation of the inhibitory nerve. The objection to cold water in acute inflammations is that the heart is compelled to do too much work, and in the event of an atheromatous vein or artery, serious damage might result. The application of cold to the periphery always increases the work of the heart. In the old, the anæmic and the feeble, the reactive power being almost *nil*, care must be exercised in using cold applications. My preference is for the use of hot water, as it serves the best purpose with the least danger.

The first effect of moist heat is to relax the coats of the vessels and relieve the pressure on them. In this way the blood is emptied and the sensory nerve fibres no longer being impinged on, there is relief from pain. The continued application of hot water, 105·F. to 140· F. either from a continuous flow syringe with a wide mouth, or from hot compresses (*i.e.* four to six thicknesses of linen towelling, renewed every two or three minutes), will give relief to nearly every case of painful erupting third molars, acute periostitis or periodontitis. Of course the syringe will be more useful for directing heated water into the mouth, but in its absence the hot moist pack will serve the purpose if continued for from ten to twenty minutes. I have succeeded in reducing enormous painful swellings around and about the erupting third molars by using the moist pack.

In acute pyorrhœa a continuous stream of hot water, 110· F. to 130· F., for ten minutes or fifteen minutes, will give great and sudden relief. For hyperæmia of the antrum hot water injection without too much force, from 115·F. to 125. F., has been found sufficient. It is seldom necessary to use hot water above 147· F. as it will produce irritation. Baruch says to use it at from 95· to 147·. After the first day's treatment, alternating hot with cold serves as a tonic.

Western Dental Journal.

INFECTION FROM THE MOUTH.

By E. L. Clifford, D.D.S. Chicago.

1. We will claim that no portion of the organism is of more importance, or is more active as a veritable chemic laboratory, than the mouth. It is established, that in the processes of putrefactive decomposition, certain alkaloids are elaborated from the proteid substances. We all know that in the cleanest mouths certain portions of these proteid substances

will remain, as they are ingested with the food we take, as well as the water we drink, and the air we breathe. We know also that in the cleanest and healthiest mouths, absence of bacteriologic influences is but an utter impossibility, and that these micro-organic agencies, furnished as they are with the proper media or food, conjoined with a suitable temperature and abundant moisture, make the mouth one of the best incubators that can be imagined. If this be so in mouths that have been no strangers to proper hygienic influences, how much more strongly is the fact established of the influence of this territory, when carelessness and neglect have been a predominant feature? And, if we accept the theory of Aitken that these alkaloidal products vary as to their poisoning power according to the stage of decay at which they are produced, how important is it that these hygienic influences be enjoined, and enforced. Then again, accepting the dictum of Gautier, that these animal alkaloids cannot be excluded from the genera economy, and that they are even necessary as a product of vital physiologic processes, it certainly becomes the duty of that branch of medical science to which the very entrance of the digestive tract is allotted for control and treatment, to see to it that contaminating influences rre eliminated. Again, if the possibility of the formation of these animal alkaloids is acknowledged without the aid of bacteriologic fermentation, as shown by Gautier, how much more deleterious mnst be their effects, and how much greater must be their production when conjoined to and assisted by these physiologic agencies. If an abnormal amount of these poisonous substances is produced within the intestines when in any way disordered, how much more reasonable to conceive that the manufacturing capacity of the mouth is greatly increased, when a condition that might be termed absolute filth is no stranger to the eye of the observant dental practitioner. If the amount of these agencies formed in the intestines of a healthy man in twenty-four hours is sufficient to kill him if absorbed and secretion stopped, it will require no great stretch of your imagination to realize that enough poison could be taken from the mouth of the average dental patient to kill a small army of inoculated subjects if properly applied. Let the physician who doubts this statement recall the condition of wounds, and ponder over the difficulties of his prognosis when called to attend a traumatism caused by the human bite. The conclusions of Dr. Brunton will also go far to account for the thermal changes which take place and accompany these traumatisms, when viewed from a clinical or pathological standpoint. Miller establishes well the part played by the human mouth as a generator of micro-organic life, and his testimony is corroborated by other investigators; not only are large quantities of the animal alkaloids produced within the intestines and other portions of the alimentary tract, but large quantities are swallowed with innumerable bacteria which have already been produced in the mouth, and, as stated by Miller, they give rise to local and general disorders of the most serious nature, produced partly by the direct action of the micro-organisms, and their products upon the teeth and the mucous membrane of the mouth, partly by swallowing large portions of bacteria, partly by carrying them into the lungs particularly in cases of violent inspiration, and finally by their obtaining an entrance into the blood or lymph vessels in various ways, such as by a breach in the continuity of the mucous membrane brought about by mechanical injuries (wounds, extractions, etc.), through the medium of gangrenous tooth pulps, which usually lead to abscess at the point of infection ; sometimes with secondary septicæmia and pyæmia with fatal termination, by resorption of poisonous waste products formed by bacteria ; by the inspiration of slime, small pieces of tartar, etc., containing bacteria, and by contact with the oral and pharyngeal cavities, whose power of resistance has been impaired by debilitating diseases, mechanical injuries, etc.

The very antechamber of man's vegetative existence, the very portal of the human body, furnishing as it does a most excellent nursery for these etiologic factors, has not received from the general profession of medicine, within the past, that attention which its importance has deserved ; but, thanks to the work and investigations of some of the members of our specialty, the physician can no longer ignore these factors and feel that he has done justice to himself and the patient who has so confidently placed himself under his care. The results of the last few years have proved that if many of the diseases whose origin is enveloped in mystery could be traced to their source, they could be found to have originated within the oral cavity. And, as to the danger of such diseases as do follow from infection traced directly to the mouth, it seems there could be but one thought, when we reflect that out of a carefully prepared table of 149 cases by Miller, there resulted 50 deaths, 19 cases of syphilis, 2 cases of blindness and two cases of a loss of a part or the whole of one of the maxillæ.

It would not be difficult to convince the observant dentist of the truths here implied; it would only be necessary, were that our object, to ask him to recall from his every day experience ample facts to substantiate the position. He has seen many times the health of his patients vastly improved by a proper care and attention of the mouth. He has studied, as a specialist, the chemic powers of decayed teeth, vitiated and poisoned secretions, and fully appreciates their power and influence, but I am forced to the belief that the physician of the past has either wilfully or ignorantly ignored the important part this portal plays in the aggravation of diseases, or as a preventive of cure. And this thought is only enhanced and enlarged by the recent practices of the more observant and faithful, in calling to their assistance the aid of the competent orist, in assisting him to re-establish physiologic perfection.

To make the attempt to enumerate and to classify the different ailments which are either caused or aggravated by the unhealthy and unwholesome condition of the mouth, would be too great a task for one paper, if it were necessary, but it is not. Miller has done and is doing this work for us, and it is our province to assist as much as possible in bringing to the notice of the profession the excellence of his work, and the importance of his conclusions. At such times as this, we can but generalize. Every physician of experience has often, no doubt, found himself in the dilemma of not being able to account for the cause of many cases in practice—and while I would not have him look to the mouth as the harbinger of all these causes, I would ask his attention to that sphere, as a possible, and I might say, a probable source in many cases.

There is no doubt that the nervous system in many instances, and by very remote manifestations, is often injured to an alarming extent by the mechanical or chemical irritation emanating from on oral organ. The alimentary tract, we know, is often deprived of the privilege of doing its proper duty by contaminations implanted into the first bolus of food, started on its course through a filthy and poisonous mouth, and added to the chemic contamination may well be mentioned the mechanical, which in cases of mal-occlusion, tender or sore teeth, or edentulous mouths prevent a proper mastication of food, entailing upon the stomach an office and a duty never designed by nature. This overwork of the stomach, combined as it often is with the chemic poisons of the diseased mouth, of course is sufficient to interrupt the proper function of other organs in the tract as they are eached, and consequently the whole canal becomes a source of irritation and of poison.

If micro-organisms are so universally present, it is to the prevention of a growth of an abnormal quantity, and to the prevention of the introduction into the organism of specific germs, that the attention of the therapist of the future will be more particularly directed.

Aside from local inoculations and their results, which are usually classed among dental diseases, there are many forms of aberrations that the condition of the mouth may be held especially responsible for. Paralyses, pareses, anæsthesias and hyperæsthesias adorn the border line where it is difficult to determine whether the case is one for the specialist or the general practitioner, but these lesions, having long been noticed as doubtful in their etiology, are not classed among the obscure, and are often brought to the notice of the specialist and his assistance sought. But in those most obscure cases where the cause is greatly clouded, mistakes are more liable to occur, and the physician often battles vainly in his efforts to restore a healthy status by the ever interfering and constantly infecting products of this portal to man's existence. Miller has shown that pulmonary and bronchial diseases are excited or aggravated by the inspiration of germs from the oral cavity, as evidenced in the case cited of J. Israel where primary actino-mycotic infection followed the lodgment of a small piece of tartar within the lung. Several cases within my own practice confirmed the theory, and I have more than once seen the benefit, and been able to bring it forcibly to the notice of the attending physician, where marked improvement followed the sterilization of the mouth, when all efforts had proved fruitless prior to this step. Alimentary disorders are of such common occurrence, as a result of defective and contaminating mastication, as to require no extended notice, and from this one condition all other organs are more or less affected, both nervous and vascular. Bednar, said to be the first to give clear expression to this view in 1854, states that "indigestion may be brought about *directly*, by taking into the stomach any substance already in a state of fermentation; *indirectly*, when the food taken into the stomach undergoes subsequent fermentation on account of its disproportion to the gastric juices." Henoch favoured this conception and found in it a cause for a large number of diarrhœas.

The Dental Register.

Reports of Societies.

NATIONAL DENTAL HOSPITAL STUDENTS' SOCIETY.

A meeting of this Society was held on Friday, May 11th, at 8 o'clock. C. W. Glassington, Esq. President, in the chair.

The minutes of the previous meeting were read and confirmed, and the usual form of welcome given by the President to the visitors present.

The following gentlemen were proposed for election as members of the Society—Messrs. Etheridge, Moore, A. E. Relph, and T. G. Rea.

CASUAL COMMUNICATIONS.

Mr. GLASSINGTON brought forward a case of Epulis occurring in a patient whom he met in consultation. There was a soft swelling on the palate in the molar region, the twelve year old molar being the only one standing on that side of the jaw. The patient wore an upper denture, which Mr. Glassington recommended her to remove for a few days, during which time the growth became much more prominent till it attained the size of a very large Brazil nut. Mr. Glassington said that it was the largest Epulis that had come under his notice, and thought that the operation of removing it was out of the Dental Surgeon's province, as it involved so much structure that the patient would require nursing and attention afterwards in case of hæmorrhage, etc., so he brought the patient to the Hospital to see Mr. Roughton. Mr. Roughton removed the growth (without extracting the tooth) at the Royal Free Hospital, and the patient made a very good recovery.

Mr. EVERITT (who was prevented from attending) sent the Hon Sec. a specimen of a supernumerary tooth that was joined to a carious upper wisdom tooth he had extracted. The tooth resembled in shape a small bicuspid.

The President then called upon Mr. C. Fox for his paper on "Fractures of the Lower Jaw," which we published in our last issue.

DISCUSSION.

Mr. GLASSINGTON said that with regard to the work at a General Hospital he thought that the assistance of any class of students would be welcomed in the out patients' department but dental students as a rule had very little time to spare, especially if they were doing the two hospitals simultaneously.

In reference to the bicuspid slipping between the fractured parts of the jaw, he thought it was very fortunate Mr. Fox discovered it in time or it certainly would have been very detrimental to the parts uniting.

Mr. Farmer said that as a rule cases of fracture were not brought to the dental surgeon, although he thought the latter the proper person to go to. He cited one case in which a patient was brought to him late at night who had fallen from a tramcar, fracturing the lower jaw, and to which he temporarily fixed a four-tailed bandage until the following morning, when he took an impression with an ordinary bite-tray, made a splint, and the patient made a very good recovery.

Another case which had come under his notice was that of a patient who came to the Hospital to have a lower wisdom tooth removed, but on interrogation it was found that he had been helping a policeman a day or two previously, and was struck in the jaw, which was fractured at the angle, thus causing the pain.

Mr. T. G. Read said he had recently treated a case of fracture occurring in a patient who had been treated medically for about a month, the doctor saying that he was only suffering from a bruise as the result of a fall. As he was still unable to eat comfortably at the end of that time, his friends advised him to consult a dentist, when Mr. Read found he had a fracture of the ramus and of the symphysis. Mr. Read applied a Hammond's splint, and when he removed it about five weeks afterwards, the patient had quite recovered. Another case that had come under his notice in America, he had treated very successfully by making a Gunning's splint.

Mr. Spokes said Mr. Fox had written an excellent Students' Society paper, and it was no doubt due to want of time that he had omitted to mention Kingsley's splint. It was, perhaps, in some of the more complicated fractures, resulting in an absolute loss of tissue and subsequent conraction that Dental surgeons would find a difficulty in aiding e general surgeon.

MANCHESTER ODONTOLOGICAL SOCIETY.

The Annual General Meeting of the above Society was held at the Grand Hotel, Aytoun Street, on Tuesday, May 1st, 1894. The President, Mr. T. Murphy, was in the chair.

CASUAL COMMUNICATIONS.

Mr. COLLETT referred to the case of a man who died as the result of swallowing his artificial teeth, and which had been reported in all the Manchester papers. Through the courtesy of Dr. Southam, who performed tracheotomy, he (Mr. Collett) was able to exhibit to the members the set of teeth.

Mr. D. HEADRIDGE exhibited and explained Mr. W. G. Routledge's low voltage motor for attaching to any ordinary dental engine, without structural alterations to the latter.

HON. TREASURER'S ANNUAL STATEMENT.

The Treasurer (Mr. Planck) read his annual financial statement, which showed there was a balance of £50 12 3, in hand.

LIBRARIAN'S REPORT.

The Librarian's report showed that several works had been added to the Library.

REPORT OF THE COUNCIL.

The report of the Council epitomised the work of the past Session, and stated that the number of members had increased to nearly eighty.

ELECTION OF OFFICERS.

The following were elected office-bearers for the Session, 1894-5:—

President—Mr. W. Dougan.

Vice-Presidents—Mr.T. Murphy, and Mr. William Simms.

Treasurer—Mr. H. Planck, re-elected.

Secretaries—Mr. P. A. Linnell, (for the Council), re-elected; Mr. F. W. Minshall, (for the Society), re-elected.

Librarian—Mr. W. A. Hooton, re-elected.

Councillors—Messrs. Wolfenden, G. G. Campion, and J. H. Jones, in addition to those whose term of office is unexpired.

VOTES OF THANKS.

On the motion of Messrs. P. Headridge and Dykes, a resolution of thanks was accorded to the retiring officers, and suitably responded to on behalf of himself and past officers by Mr. Murphy.

THE NEW PRESIDENT.

The retiring President then vacated the chair, which was taken by Mr. W. Dougan, who, in appropriate words, thanked the members for electing him to the honourable position of President. The proceedings then terminated.

Dental News.

THE AMERICAN DENTAL SOCIETY OF EUROPE.

The 19th Meeting will be held at Geneva, Switzerland, Aug. 6th, 7th, and 8th, 1894. Last year this annual gathering was omitted, as many members wished to attend the Columbian Dental Congress. Americans practising dentistry in Europe who may wish to join the Society should make written application to the Membership Committee of which Dr. J. H. Spaulding, 4 Rue de Rome, Paris, is Chairman. For further information, or for programmes, application should be made to Chas. W. Jenkins, Secretary, No. 1. Sonnenquai, Zurich.

PASS LISTS.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

The following gentlemen passed the first examination for the Licence in Dental Surgery :—David Alves, Montrose ; Charles Albert Lightfoot, Newcastle-on-Tyne ; Alexander Munro, Edinburgh; John William Edward Stewart, Dundee, Henry Alfred Coleman, Wrexham; Charles Wood, Carlisle; Ralph Carr, Newcastle-on-Tyne; Frederick Cornel Dopson, Liverpool; William Edward Stewart, Dundee; Thomas Alexander Mackintosh, Albert Leeming, and John Lewis Shields. —The following gentlemen passed the Final Examination and were admitted L.D.S. Edinburgh:—Robert Lindsay, Edinburgh; John Kyle Mackintosh, Inverness; David Robertson Campbell, Glasgow; Alexander Young, Halifax; Murray Forbes Thomson, Dublin; Frederick Robert Guyler, Liverpool; Joseph Morton, Carlisle; and Malcolm James Mac Gregor, Edinburgh.

FACULTY OF PHYSICANS AND SURGEONS OF GLASGOW.

At the May Sittings of the Dental Board the following candidates passed the First Dental Examination.

A. E. Lepperson, F. H. J. Carter Braine, J. C. Gardner, Wm. M. Knott, Wm. C. McGowan.

The following candidates passed the Final Examination.

Ezekiel Agnew, Edinburgh: James D. Forrest, Glasgow; Wm. M. Knott, Birmingham; Andrew McCash, Glasgow; Jenner Plomley, Maidstone.

ROYAL COLLEGE OF SURGEONS IN IRELAND.

Dental Examination.

The following gentlemen having passed the necessary examination have been admitted Licentiates in Dental Surgery of the College.

Sydney Aveline, Reading; Richard Neller Kiddle, London; Randolph Llewelyn Pollard, London; Ebenezer Poock, London; and Francis Owen Stoker, Dublin.

EXAMINATION PAPERS.

Tho following were the questions in the written part of the recent examination for the diploma in dental surgery, at the Royal College of Surgeons of England.

Anatomy and Physiology and Surgery.

2 to 4 o'clock, P.M.

N.B.—The Candidate is required to answer at least one of the two questions, both on Anatomy and Physiology, and on Surgery and Pathology, unless he is entitled by the Regulations to exemption from any of those subjects.

Anatomy and Physiology.

1. Describe the tempero-maxillary articulation. What movements take place in this joint, and what muscles produce them?

2. Explain the manner in which ordinary inspiration and expiration take place.

Surgery and Pathology.

3. Describe a Sinus. From what causes do Sinuses (or Fistulæ) in the neighbourhood of the mouth arise, and how should they be treated?

Describe the signs of congenital Syphilis in an infant and in a child up to the age of puberty. Give the treatment.

Dental Anatomy and Physiology and Dental Surgery.

5 to 8 o'clock, P.M.

N.B.—The Candidate is required to answer at least two of the three questions, both on Dental Anatomy and Physiology, and on Dental Surgery and Pathology.

Dental Anatomy and Physiology.

1. Describe, with examples drawn from fish, reptiles, and mammals, the means by which teeth are kept efficiently sharp or rough during wear.

2. Give a short general account of the calcification of teeth. At what period does it commence in the several teeth of (*a*) the temporary, (*b*) the permanent dentition?

3. Give an account of the tooth-follicle wall, its origin and after history. Mention some tooth-germs which are devoid of follicle wall.

Dental Surgery and Pathology.

1. Some days after several contiguous teeth have been filled, pain arises. How would you diagnose the cause of the trouble? Give treatment for the various conditions which may be present.

2. What are the advantages and disadvantages of capping the back teeth in the treatment of irregularities? In what cases is it essential to do so?

3. What drugs administered internally or applied locally injuriously affect the teeth and associated structures, and in what way do they do so, and what constitutional diseases may be simulated?

The following papers were set at the May Examination at the Royal College of Surgeons in Ireland.

Dental Surgery.

1. Ulceration and abscess of pulp; give its definition, etiology, pathology, diagnosis, prognosis, and treatment.
2. What is dilaceration?
3. Write in full prescriptions for Stomatitis and Pyorrhæa.
4. What are the relative advantages of capping and destroying the pulp; describe your method in each case.

Dental Metallurgv.

1. Give the process of making Sullivan's cement.
2. What are the ordinary amalgams used by Dentists composed of?
3. How is platinum obtained? Give its specific gravity, atomic weight, melting point, and special uses in dentistry.
4. How is silver purified for amalgams.
6. Give the relative merits of gold, platinum, silver, tin and copper in amalgam.

Anatomy.

1. Give the names and positions of the salivary glands
2. Describe the articulation of the vomer, and where it is situated.
3. Enumerate the muscles of mastication and give their nervous supply.
4. Describe the development of the teeth.
5. Describe the calcification of the tissues of the teeth.

General Surgery.

1. Dislocation of the Jaw, describe the forms, causes and treatment.
2. Describe the poisonous action of chloroform and its treatment.
3. Describe the forms of stomatitis and their treatment.
4. Give a definition of epulis, describe its forms and treatment.
5. What diseased conditions are seen in the mouth in secondary and tertiary syphilis.

DENTAL ASSISTANTS' ASSOCIATION OF GREAT BRITAIN.

We published a paragraph on this Association in our last issue, and General Assistants desirous of becoming members have applied to us for the address. All enquiries should be addressed to the Secretary at 30, Cursitor Street, Chancery Lane, W.C.

PROSECUTIONS UNDER THE DENTISTS' ACT.

HEAVY PENALTY.

Two prosecutions, were heard by Mr. F. J. Headlam, at the Manchester City Police-court, on the 8th inst.

James M'Donald, of 29, Piccadilly, was summoned for using the words "dentist" and "dentorium," he being an unqualified person and not entitled to do so. Mr. Turner, barrister, London, appeared for the prosecution, and Mr. W. Corbett represented the defendant.

Mr. Turner stated that the two words appeared on the defendant's premises and card many times. Piccadilly, where the premises were situated, was one of the busiest thoroughfares in Manchester. The advertisements were very conspicuous, and calculated to arrest the attention of persons passing them. Though the defendant's card was headed "M'Donald's Free Dentorium," and the word "Dentist" was given as the telegraphic address, he knew nothing about dentistry. When he was spoken to, the defendant said he did not claim to be a dentist, but with regard to the words "Dentists' Emporium," he said he had consulted counsel, who had said he was entitled to use those words.

Mr. Corbett, for the defence, submitted that there was no offence under the Act. The defendant had not held himself out as a dentist. As a matter of fact, the defendant had a qualified dentist in charge of the place, and, therefore, anyone who went there expecting to see a dentist was not deceived.

Mr. Headlam expressed the opinion that the offences complained of had been committed, and inflicted a fine of £10 for the use of the word "dentist," and a further fine of £5 for the word "dentorium." He also ordered the defendant to pay £5 extra costs.

Arthur Lestrange, of Stockport Road, was summoned for using the words "Ardwick Dental Surgery." The premises were visited by an agent for the prosecution, in May. Defendant stated that he did not know he was infringing the law. The establishment had since been taken over by a qualified man.

Mr. Hislop, who appeared for the defendant, contended that the use of the words "dental surgery" was no offence. The defendant was an expert though not a qualified man. A fine of £5 and costs was imposed.

ACTION AGAINST A MORECAMBE CHEMIST.

Robert Knowles, chemist, Morecambe, was charged before the County Petty Sessions, at Lancaster, on the 9th inst., with an infringement of section 3 of the Dentists' Act by describing himself as a dentist at Morecambe on the 30th March and the 9th May.

Mr. R. Turner, barrister, of London, appeared in support of the information, and Mr. Tilley appeared for the defendant, who pleaded not guilty.

Mr. Turner, in opening the case, referred to the Dentists' Acts of 1878 and 1885, which required the registration of persons qualified to hold themselves out as dentists, making offenders liable to a penalty of £20. The defendant was summoned on two informations for using the word dentist and other descriptions. It appeared that the defendant last year purchased the business and practice of Mr. Cutts at Morecambe. The defendant is a chemist, and on his window were the words "dental depot" and "teeth extracted." At the door was a rubber mat with the word dentist in rubber letters. Those things were seen on the 2nd of March and the 29th of May. On the latter occasion the mat was turned upside down, but the word could still be made out. The defendant admitted that that was done for the purpose of avoiding the Act, so it was evident he had it in his mind and was endeavouring to evade it.

Hesketh Riley, clerk to Messrs. Clark, Oglethorpe and Co., Solicitors, spoke to visiting the defendant's premises in March and seeing on one side of the window "dental depot" and on the other "teeth extracted." There was also a case of artificial teeth at the door. When he went inside he saw the mat in the middle of the floor. It was then right side up.

Mr. Thomas Smith, managing clerk to Messrs. Bauman, Bouverie, and Co., Solicitors, London, also gave evidence. He visited the shop on the 29th May, and saw the same placards in the window as the previous witness. The mat was in the doorway and was wrong side up. He could read the word dentist upon it. Mr. Knowles said "I turned it up on purpose." He told him that proceedings would be instituted under the Dentists' Act. He saw the "Morecambe Visitor," and the defendant had an advertisement in it. Defendant said he did not intend to deceive the public. Witness was cross-examined by Mr. Tilley.

Mr. Tilley for the defence contended that the words used by the defendant did not constitute an offenee. He also took objection to the form of the informations.

The Bench amended them, and

George Kitchen, the defendant's apprentice, was called to speak to the state of the mat. He said that it was always put wrong side up.

The Bench considered the case made out and imposed a fine of 20s. and costs for the latter offence.

ADMINISTERING ANÆSTHETICS FOR UNREGISTERED DENTISTS.

At a meeting recently held of the Society of York Dentists, the following resolution was unanimously carried and sent to the York Medical Society:—

This Society wishes to make known to the members of the

Medical profession, that the Dentists' Act require all persons practising dentistry to be registered, and respectfully urges the members of the York Medical Society to express their disapproval of Medical practitioners administering anæsthetics for unregistered Dental practitioners in York, such practice being considered unprofessional, and calculated to encourage and support quackery and fraud.

The following resolution, passed unanimously by the York Medical Society, was received in reply :—

"That this meeting of the Society considers it unprofessional for registered Medical practitioners to administer anæsthetics for unregistered Dentists."

APPOINTMENTS.

Mr. Edgar Field, L.D.S. Eng., has been appointed Dental Surgeon to the Croydon General Hospital and to the Croydon Provident Dispensary.

Mr. Montague F. Hopson, L.D.S. Eng., has been appointed Dental Surgeon to the Hampstead Hospital.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the British Journal of Dental Science.

Sir,—Will you kindly allow me space in your Journal to call attention to the small amount of wages paid to Dental Mechanical Assistants? Considering the skill required, the closeness of the work, and the large amount of profit made, no one can dispute the fact that the workman is badly paid. Beyond the cost of bare material, gas, etc., the employer has no other expense, no wear and tear of machinery, and no risk, that he might reasonably be expected to pay better wages. If Assistants would combine together and form some kind of Union or Society, they would be able to demand a fair share of the profits, and, I am sure, were the facts of the case laid before the public, its sympathy would go with the Assistants. By the passing of the Dental Act, the profession has been raised socially, but the most important part of the work, *i.e.*, the mechanical, is still done by the same class of men as before, men who have neither the money nor time to cram through a few examinations, and who could, by working for themselves, produce the same denture, for one-third the prices at a good profit to themselves. Surely something could be done to better the condition of this by-no-means unimportant section of the profession, and I hope the time is not far distant when Dental Assistants will join together to promote the benefit and welfare of their class. Thanking you in anticipation,

I am, dear sir,
Yours truly, AN ASSISTANT.

Dental Hospital Reports.

WORK DONE at the Victoria Dental Hospital of Manchester during the month of May, 1894.

Number of Patients attended	718
Number of Extractions	354
Number of Extractions under Anæsthetics	201
Gold Stoppings	53
Other Stoppings	123
Miscellaneous (advice, temporary fillings, scalings, dressings, &c.	267
Crowns	4
Irregularities.	21
Total	1744

HERBERT G. ASHBY, *House Dental Surgeon.*

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.

2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.

3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.

4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.

5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.

6. The Journal will be supplied direct from the office on PREPAYMENT of subscription as under:

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British Journal of Dental Science.

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THE RETENTION OF ARTIFICIAL DENTURES IN EDENTULOUS LOWER JAWS.*

By David Hepburn, L.D.S., Eng.

Mr. President and Gentlemen,—It is the wise custom of this Society from time to time to dispense with the formality of a paper and in lieu thereof hold an open discussion upon some subject of general interest to dental practitioners. Lately an ably introduced and important discussion has taken place in connection with the surgical side of our special work and this evening has been set apart for the consideration of a subject purely within the scope of that department of practice which comes under the head of Dental Mechanics. The subject before us is "The Retention of Artificial Dentures in Edentulous Lower Jaws."

Your Secretary has done me the honour of inviting me to open this discussion, and I imagine that I am right in conjecturing that we have not to deal with those everyday cases which present no special points of interest or difficulty, and which may be treated in various ways according to accepted principles, but rather to confine ourselves to the consideration of those cases of peculiar difficulty which present themselves happily only from time to time, which cause much uneasiness to the patient, are a special tax upon the patience and ingenuity of the practitioner, and which for want of a more elegant term we may call "slipping lowers,"

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* Read before the Odontological Society of Great Britain.

The subject is so essentially practical that in undertaking to bring it before you I have been exercised to know how to surround it with the interest it deserves, more especially as I am unaware that its varying aspects have hitherto been formulated, but my remarks will be as brief as possible consistently with the importance of the subject, and your discussion will, I doubt not, supply the interest which I myself may fail to impart.

The difficulty then upon which, by our discussion, we wish to throw light is that which reveals itself when a patient, probably advanced in years, seeks the aid of the dental practitioner with the view to obtain artificial aids to mastication, all the natural teeth being lost and not even the roots remaining. A set of artificial teeth is adapted, and hopes of success are entertained on both sides, but as the early days of trial progress it is found that the lower denture has a tendency to slip forward and protrude, and as it does so the mucous membrane is irritated in particular regions causing much pain and more or less ulceration. These symptoms are relieved by filing, or "easing," as it is called, the denture, and for a short space of time a certain degree of comfort may be secured, but shortly fresh spots of ulceration appear and the relieving operation has again to be repeated, and this goes on until eventually the denture becomes obtrusive by its forward movement, and the whole original adaptation of the articulation is disturbed.

The case may be commenced *de novo*, but with the same unsatisfactory result, and it may only be after many weeks of patient endurance on the one hand and patient work on the other that some end to the trouble arrives by the denture finding a resting place far away from its original seat, by slipping forward to lie in the sulcus between the anterior surface of the maxilla and the inner lining of the lip. Such cases have doubtless occurred, happily they may be rare, in the practice of most of us.

What, then, are the conditions leading to this result?

At the risk of being wearisome let me recall to your minds a few simple facts connected with the anatomy of the lower jaw which have a direct bearing upon our subject. The inferior maxilliary bone varies much at different periods of life. It consists of a curved horizontal portion, or body, and two perpendicular portions, the rami, which join the posterior portion of the body on either side. At birth the rami join the body at an oblique angle. As maturity advances and up to middle life the obliquity of this angle diminishes until the junction is rectangular. With advancing years, however, the original obliquity is gradually re-assumed, and in extreme old age the angle of the jaw, returning as it were to its second childhood, assimilates the condition which it originally presented at birth. It is this obliquity in its more exaggerated form which plays an important part in rendering the inferior maxilla intolerant of the presence of artificial dentures.

Accompanying these changes we have in advancing years, and in some cases earlier in life, the entire disappearance of the alveolus, that portion of the jaw which seems to be wholly subservient to the presence of the teeth, it being non-existent in the infant jaw previous to the eruption of the teeth, strongly developed in middle life so long as the permanent dentition is retained, and again absent in extreme old age, when the natural organs of mastication have disappeared, or represented merely by a more or less elevated ridge along the superior border of the body of the jaw, covered with mucous membrane of greater or less thickness and fibrosity.

Comparing, then, the normal adult jaw with the one typical of old age and viewing it laterally on its external aspect, we will notice the position of the mental foramen. In the first case, it is mid-way between the superior surface of the alveolus and the base of the jaw; in the second, the alveolus having disappeared it opens close to the superior surface of the body of the jaw at which point its nerves and vessels spread out directly to the mucous membrane. Of this there may be only a sparse covering, thus rendering it peculiarly sensitive to the continued pressure of a foreign body such as an artificial denture.

Again viewing laterally the internal surface of the inferior maxilla we will observe the position of the mylo-hyoid ridge for the attachment of the muscle of that name. It is practically midway between the superior surface of the alveolus and the base of the jaw. In the jawbone of old age, or where extreme absorption has taken place, it is, for a considerable part of its course, almost on a level with the superior surface of the base, thus creating a region peculiarly intolerant of pressure, not only from its sparse covering of mucous membrane, but also by the movement of the muscle attached to it.

Another point to be noted on this aspect of the jaw is the group of genial tubercles, four in number and situated on the inner side of the symphysis for the attachment of the genio-hyoid and genio-hyoglossi muscles. When extreme absorption has taken place these tubercles, often merged into an indefinite mass, form, with their tendinous attachments and superjacent structures, a prominence upon which no denture can rest. Indeed, sometimes they seem to persist until they appear to form the highest point of the superior surface of the jaw. When such is the case they create the existence of an inclined plane anteriorly, and it is from this eminence that a denture will often slip in a downward and forward course until it rests in the sulcus of the lip.

In addition to these immediate aspects of the body of the jaw itself with its membranous covering, we have conditions of mobility permitted by the temporo-maxillary articulation which differ from, or rather are an exaggeration of, those which this joint is capable of performing during the period when the natural teeth are still existent. These altered movements are not favourable to the retention of artificial dentures. It is needless to refer to the various structures of the joint itself, suffice it to say that in the normal action of opening the jaw the condyle leaves the glenoid cavity and slides on to the eminentia articularis. As most bony eminences become modified with advancing years so it is with this one. Indeed, on examining the skulls which I have on the table (ages 73 and 78) it will be seen that the particular eminences referred to have in great measure disappeared. Thus in opening such jaws greater sliding movement exists. This, combined with general laxity of the muscles, and the absence of the more definite articulation which the presence of a full natural set of teeth would indicate, allows all the movements of the jaw to become exaggerated more especially the backward and forward movement. This tends greatly to the displacement of dentures.

Further all these senile changes are frequently associated with alterations in the spinal column ; this losing its original curves assumes the arched form. Thus to the head is imparted a fixed downward and forward position which causes the jaw to rest most naturally in a state of protrusion. By reason of this the space posteriorly between the upper and lower maxilla is, in consequence of the oblique ramus,reduced to a minimum. Therefore, when artificial teeth are present the tendency is for the back blocks to come in contact unduly and so cause the whole arrangement to be tilted and displaced.

Affecting also the lower denture we have the muscular force of the tongue. This active organ seems to retain its power to the last even when the counteracting action of the cheeks and lips is practically absent in consequence of a wasted and flaccid state of their muscular tissues.

Finally, apart from these physiological and anatomical adverse changes, another set of difficulties, the accompaniments of age, have to be contended with, intolerance of pain, inability to control the movements of the jaw, and many others, but to these I need not refer.

The points I have endeavoured to emphasize may exist separately or combined and in all modifications, and I am aware that it is not only in the aged that many of them are to be found, but I have chosen to describe the extreme case, feeling strongly in my own mind that the first step towards successful treatment is the intelligent appreciation and recognition of the adverse conditions with which we have to contend. Before leaving this part of my subject, therefore, let me sum up what appear to me to be the main features inimical to the presence of artificial dentures in this class of edentulous lower jaws.

(1) The almost complete or total removal by absorption of the alveolar ridge.

(2) Abnormal thinness and sensibility of the mucous membrane.

(3) The presence of ridges or bony prominences sparsely covered with soft tissue.

(4) Extreme obliquity of the angle of the jaw, causing diminished space posteriorly between the upper and lower maxillæ.

(5) Undue and uncontrollable movements of the temporo-maxillary articulation.

(6) Protrusion of the lower maxilla, due to senile curvation of the spine.

(7) Inimical action of the tongue, uncontrolled by resistance of muscles of cheek and lips.

Lastly, I would mention an easily recognised and distinct variety of case not associated with extreme age, but with extreme absorption, where the muscles retaining their full power and perhaps being abnormally developed, tend forcibly to lift dentures from their position on the remains of the ridge.

And now, gentlemen, with regard to treatment my remarks must be very cursory. Consequently, I will merely touch lightly on those points upon which I hope you will enlarge.

Provided, then, that careful impressions of the parts have been obtained, the most natural antagonism of the maxillæ ascertained by the usual methods, and suitable dentures designed, the question presents itself as to the employment or non-employment of spiral springs as means or aids to retention. I would suggest that, wherever possible, these adjuncts should be dispensed with, as by reason of the inclined plane presented by the surface of the lower jaw, and the confined space open for their action, they may tend to displace to a certain extent the lower denture. This is obvious, considering the direction of the thrust which these conditions create. At the same time I believe there exists a certain class of case where the employment of springs is indispensable. Typical of such are the cases I have endeavoured to pourtray in my diagrams. In such the retention of the upper denture by means of suction power may prove impossible.

When, therefore, the necessity arises for adopting springs, with their concomitant swivels, certain points must be adhered to.

In view of the limited space offered at the posterior part of the mouth for their reception, both by the proximity of the maxillæ and the intrusion of soft tissues, they must be brought well forward. Further in lieu of placing the lower swivel slightly in advance of the upper one as in ordinary cases to provide for the opening and closing of the jaws, they should at the outset be placed in the vertical line, and in this position they should be *blocked*. By "blocking" I mean they should be confined in their action by inserting "pegs" or "stops" in proximity to the swivel heads. By this means the direct thrust of the spring is maintained, even in the backward and forward movement of the jaws. Deeply cut chambers will sometimes suffice for this, but frequently there is no room to permit of their presence. The blocking provides also against the contingency of the springs irritating the soft tissues at the angle of the jaw as it turns upwards towards the coronoid process. Thus judiciously arranged springs will often act efficiently as means of retention, not only of the upper, but also of the lower denture in those cases where the stability depends upon the existence of a fixed point in the other. The consideration of the adjustment of spiral springs would, I know, form a theme in itself, but on this head I must content myself with these few remarks.

Dental surgeons will receive eagerly any suggestion which tends to obviate the slipping of lower dentures, and by the kindness of Mr. Lennox, of Cambridge, I am able to-night to show you his ingenious contrivance designed to this end. It was, I believe, first shown by him at the meeting of the British Dental Association at Exeter, and the arrangement is so simple and original that I will not attempt to describe it, but will simply pass the example, which he has been good enough to lend me, round for your inspection. Mr. Lennox tells me that an old lady, aged 93 years, has for four years used, with perfect comfort a set of teeth fitted with the device. This is great testimony in its favour. In the particular specimen now exhibited there appears to be no marked approximation of the maxillæ in the posterior region, but it is obvious the device could easily be adjusted to the minimum space, which is a great advantage.

The most heroic treatment is that suggested by Mr. Dall, of Glasgow, who has written to me expressing his regret at his inability to be present at this meeting. As you are aware, the main feature of the treatment consists in the creation, by operation, of sockets suitably located in the body of the jaw. Into these sockets pivots or posts attached to the under surface of the denture are inserted by means of which the sockets are permanently maintained, and stability of the denture secured. Mr. Dall has devoted much time and attention to this mode of treatment, and in writing to me, he says: "I would gladly send my models, but as they need explanation which I alone can give, I think it is better to withhold them, as they might only cause some misunderstanding. As yet, I have little more to say on the subject since I brought my method before the Birmingham meeting, but I am watching with interest the same cases within my reach, taking impressions occasionally to see how they progress, so that when I bring it forward again at some future date, I shall be able to say more fully where I have succeeded and where I have not."

Under these circumstances, and especially in the absence of Mr. Dall, I refrain from enlarging on this subject, but I am sure all present will feel gratified to know that Mr. Dall is still pursuing his experiments, and that there is a prospect at some future date of hearing more concerning them from his own lips.

Let me pass on, then, to another method, namely, that of "weighting" lower dentures to ensure stability. I believe that in one class of case I have referred to, namely, that in which the reflections of strong muscles tend to lift dentures from their place, the principal is one of greatest service and will often bring about most gratifying results. I have, however, in my own practice, encountered a case where, so strong was the muscular resistance, that after prolonged trial on the part of a most intelligent patient a heavily weighted lower plate of artificial teeth had to be discarded. A well defined ridge existed, combined with a favourable bite, but so strong was the resistance that, although all superfluous edges were removed, the denture was no sooner applied than it was lifted bodily up to float loosely in the mouth like a storm-tossed vessel in an angry sea. In the majority of such cases, however, time and patience will work wonders, and the principls is one well worthy of all consideration.

With a view to obviating the distressing pain caused by pressure on the mucous membrane, various means may be adopted with possible success. Amongst these I may mention lining the denture with gutta-percha. I have in my own mind at this time one case out of a number where this process was employed with distinct benefit. As absorption progressed (and it never ceases), layer upon layer of gutta-percha was added until the denture measured more than an inch in height. The mucous membrane became absolutely tolerant of it and stability was secured. The disadvantages, however, of gutta percha are great, mainly the impurity which it acquires after prolonged use. Another method also worthy of mention is that of setting up the denture on a base of "soft" or better still "velum rubber." The velum rubber should be baked in type metal moulds to ensure a smooth surface, and the baking process occupies six hours. The moulds require some ingenuity for their construction, but the immediate result of so soft and pliant a base applied to a sensitive mouth is distinctly good.

The perishable nature of the base, however, and the impossibility of paring it away without destroying its surface should ulceration occur, detract much from its advantages. On the whole an ordinary vulcanite base, made as narrow as possible with well rounded edges, and well strengthened if necessary, seems the most serviceable medium in the majority of cases.

And now, in conclusion, a few words of my own experience in the treatment of these fortunately rare cases, so far as obtaining the most favourable articulation is concerned. I believe the difficulties can only be overcome, or at least a certain measure of success attained, by personal adjustment of the denture to the mouth itself through repeated trials. Consequently, during these initial stages of "fitting," frequent visits at short intervals on the part of the patient are absolutely essential.

Having thoroughly ascertained by examination the various aspects of the case, and having formed a prognosis as to the probable difficulties which will arise, impressions should be taken, preferably in plaster of Paris. When these are cast and trial plates prepared, the proximate articulation should be taken, with the head in the upright position, or bent slightly forwards. Thus we are likely to obtain an indication as to the most forward position which the lower jaw can assume without undue effort. To this "bite" the upper denture may be made, and the lower one set up in wax, keeping the lower front teeth well within the upper, both as to position and height.

If springs are to be used they should be temporarily adjusted, and the arrangement then tried in the mouth, changing the position of the swivels if necessary.

Almost invariably this articulation, notwithstanding the precautions employed, will be found at fault, the lower denture having slipped forward, as it is bound to do, causing forcible impingement of the lower front teeth against the upper ones. I should then slightly cover the crowns of the teeth with a thin coating of pink wax dropped upon them in a molten state and reinsert the dentures while the wax is still very soft, requesting the patient to close the teeth so as to mark the antagonism. Taking the dentures out of the mouth they should next be united according to the indication thus obtained. I would then set the lower plate, while the two are still united, in a bed of plaster and make a movable over-turn of the upper as shown in the accompanying specimen. Discarding the original models the bite may be finally adjusted to this articulation, the position of the teeth alone being thus modified while the relation of the base to the mouth remains unaltered. The teeth, in doing this, should again be set well back, and no prominent cusps allowed to interfere with the free gliding of the jaws. In the posterior region vulcanite blocks are often preferable to teeth, and in the upper denture additional canines in the place of first bicuspids allow of freer movement without tilting.

Success, I believe, depends mainly upon judicious allowances being made for eccentric movements, not only of the denture on the jaw but also of the jaw itself. And now, Mr. President and gentlemen, having trespassed already too long upon your time and patience, with a few explanatory words concerning my diagrams and specimens I will leave this wide and interesting subject in your hands.

Extinct Marsupials.—In the South Kensington Natural History Museum may be seen placed side by side, for comparison, the skulls of the extinct Diprotodon and of the existing Kangaroo. As is well known, existing marsupials, with the exception of the opossum in America, are only found on the Australian continent; but the remains of extinct species are found in Europe and elsewhere. Recently the bed of Lake Mulligan in South Australia has been laid bare, and immense quantities of the bones of Diprotodon, and other marsupials, have been discovered. It is suggested, that the tons of skeletons found represent the crowds of animals which came to drink at the lake, some of which from time to time became fixed in the mud and were drowned. The dead bodies of others were, no doubt, carried down into the lake by the streams flowing into it.

THE RELATION BETWEEN AFFECTIONS OF THE TEETH AND OF THE EYES.

By Dr. N. Feuer, (of Budapest).

Translated by Sydney Stephenson, M.B., Surgeon to the Ophthalmic School, Hanwell, W.

(*Continued from page* 536.)

Passing next to latter-day writers, we at once hit upon Hutchinson's[57] series of four cases, of which, however, only three relate to amblyopia of dental origin. Not one of these cases, in my opinion, can be considered as due to dental irritation, for they can all be assigned to other and more natural causes.

The facts of the first case, entitled "Neuralgia of the eyeball, cured by the extraction of a stump," are as follows:—

A woman, aged 28 years, had suffered for about a month from pains in the left eye and in the forehead. The eye, watery, irritable, and intolerant of light, could discern large capital letters, but accurate trials of sight could not be carried out because of the photophobia. The patient made no complaint of toothache, but examination disclosed a carious molar in the upper jaw, which was tender on pressure. After extraction of the tooth, all the symptoms at once vanished; the eye no longer irritable, could read well.

In the foregoing case, then, extreme irritation of the eye, weakness of sight, and photophcpia were induced by irradiation along the first branch of the fifth nerve. As shown by the history, however, Hutchinson did not allow himself to be misled as to the true significance of these symptoms.

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[57] Hutchinson. Royal London Ophthalmic Hospital Reports, 1865, p. 381—8.

That genuine amblyopia of reflex character was not present in the other cases, may be gathered from a critical examination of the first, and apparently the most conclusive, of the series. With all due respect to its distinguished author, we may at once proceed to discuss the case, and to examine it in all its bearings.

Mrs. S., 46 years of age, stout, florid, and in good health, consulted Hutchinson on account of a tumour developing in connection with the left masseter muscle. The left eye, which diverged considerably, was almost completely blind. The patient stated that, three years before coming under notice, she had suffered from a swelling of the right upper gum, for the relief of which leeches were repeatedly applied. Rather suddenly, the left eye became blind, a state of affairs for which the patient held the repeated leechings responsible. Later on, the stump of a tooth was extracted, and forthwith the swelling of the gum disappeared ; sight, also, improved somewhat, although she never became able to see more than the largest objects. Ophthalmoscopic examination revealed nothing abnormal ; the disc possessed its proper colour, and was not cupped. The eyeball was not hard.

We may conclude from the text that Hutchinson derived his information from the patient herself, whose statements might or might not be trustworthy. The following alleged facts, then, depend upon such evidence alone : (1) that, prior to an affection of the right upper gum, the sight of the left eye was good ; (2) that the sight of the left eye became suddenly affected after the dental trouble had made its appearance ; (3) that, after removal of a stump, sight, previously almost lost, improved a little, although never reaching the normal standard. Now had the sight of the left eye been really good three years before Hutchinson saw the patient, there must have been at the time of examination some visible alteration of the optic disc, such as slight pallor.

The reason for this statement is simple. The chain of reflex irritation would be broken by extraction of the stump; and continued weakness of sight could come about only in presence of structural changes in the eye, which would express themselves in an altered condition of the papilla, if not by changes in the retinal vessels. Yet, upon Hutchinson's showing, such changes were not present. Further, it would be a most unlikely thing for a right-sided dental affection to cause disease of the left eye, sparing at the same time the eye of its own side. Hutchinson makes the significant statement that the eye diverged considerably. Now we know that such deviation generally occurs in eyes amblyopic from birth or from early childhood, and it is also known that such eyes may manifest absolutely no signs of disease, either internally or externally. The above facts seem altogether to negative the conclusions drawn by Hutchinson as to the pathogeny of the case, which we incline to regard as an example of congenital amblyopia, *i.e.*, that the defect in sight was present before the swelling of the gum and the application of leeches. Even if we do not admit that the patient was actuated by some grudge towards her former doctor, it is highly probable that she belonged to that numerous class of persons who in advanced life, discover (by accident or from the oculist) for the first time that the sight of one eye has been defective since birth.

Wecker, [58] a no less distinguished author, translates, without criticism, Hutchinson's three cases for Delgrado, the Madrid oculist, in the *Annales d'oculistique.* To them, he adds another example of complete amaurosis drawn from his own practice, of which hysteria may well have been the explanation. The case was as follows:

Madame Ch., a sempstress, 28 years of age, had suffered for a long time from severe pains in the upper jaw. Upon one occasion, after a violent paroxysm had almost abated, the patient found that she had quite lost the sight of the right eye. Foot baths and blisters led to no result, and the patient resumed her usual occupation. Fourteen days later, severe pain set in upon the left side of the jaw, after the cessation of which she was horrified to discover that she was completely blind in both eyes. Next day, she was brought to the clinic, where her condition was found to be as follows: the gait was that of a blind person, and it was doubtful whether she possessed even perception of light; the semi-dilated pupils were irresponsive to light; the fundus oculi was normal. Simulation seemed out of the question in the case of Madame Ch., as she had three children of tender age to provide for. Three days later, by Wecker's advice, chloroform was administered, and five decayed teeth extracted from the left side. As soon as consciousness was recovered, the patient stated that the sight of the left eye had returned, and when examined five days later the vision of that eye was perfect, while the right possessed accurate perception of light. A severe inflammation of the right side prevented immediate extraction of three other carious teeth, an operation which was finally performed seventeen days later. Almost immediately, the functions of the right eye were regained, and examination a few days later demonstrated normal sight in both eyes. During this time, pills of valerianate of zinc had been taken, but Wecker does not think they had anything to do with the happy issue of the case.

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[58] Wecker. Ann. d'ocul. 1886, p. 134.

Delgrado, (*ibidem*) replying to Wecker, quotes the opinion of his teacher, Desmarres,[59] to the effect that, while amblyopia not infrequently results from decayed teeth, amaurosis is never observed. Nevertheless, Delgrado accepts Wecker's case as evidence to the contrary, and records the following additional observation ; a lad, 11-12 years of age, was brought from Toledo to consult Delgrado. The patient's sight had been for some time defective from choroidal mischief, but coincidently with an attack of toothache, it had failed to an alarming extent during the last 15 days: amblyopia was present, and the boy was unable to discern the outspread fingers. After removal of two decayed molars, sight improved to such an extent that the lad could read the smallest characters of Jaeger's test-type.

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[59] Desmarres. Tr. des Maladies des Yeux, 1858, II. Edit., Bd. iii., p. 584.

As regards this case, it is of course possible that the patient had exaggerated his symptoms, as children often do, in order to excite compassion and sympathy.

Alexander [60] records a remarkable case, which may be thus epitomised :

The sight of a man, aged 26 years, had failed continuously for five months, at the end of which time the right eye saw Jaeger No. 10 with difficulty and possessed only $\frac{1}{16}$ normal sight, while the vision of the left eye equalled $\frac{1}{7}$ and Jaeger No. 6 fairly well. Media clear ; fundi normal, save for as somewhat hyperæmic optic disc. Blood-letting and foot-bath produced no improvement. Nine days after his reception, the patient complained of a violent toothache, which had robbed him of sleep during the whole of the previous night. The pain originated in the first molar of the right side, and extended over the whole of the right half of the head and face. Such pain, it should be noted, had been present on former occasions, but no particular attention had been paid to it. Examination of the eye disclosed these results : right eye reads Jaeger No. 15 with difficulty and recognizes Snellen No. 60 ; left eye reads Jaeger No. 6, as formerly. The decayed tooth was extracted, and a week later the sight of the right eye was $\frac{6}{9}$, that of the left eye being normal.

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[60] Alexander. Klin. Monasthl. für Aug., 1868, p. 42.

Galezowsky communicated the following case to the *Societe francaise d'Ophthalmologie* in 1886 :

A lady lost the power of reading,upon a tooth being stopped. The filling was removed, when the patient recovered use of the eye. The tooth was again stopped, and sight was again lost. A definite cure was finally obtained by removal of the tooth.

Wit de Witchal[61] saw blindness of twelve years' standing quickly cured after the removal of a first bicuspid tooth. A fistulous opening was present in the corresponding alveolus. Details are not given as to the exact ophthalmoscopic condition of the patient.

Of a series of eight cases of "Damaged sight due to dental diseases," published by Keyser,[62] six were instances of amblyopia.

Further cases of a similar kind have been communicated by Salter, [63] Sirletti,[64] Lardier,[65] Mengin,[66] Marshall and Butler,[6] Widmark,[68] and by several other dentists and oculists. In spite of their titles, many of these cases have, however, little or nothing to do with *amaurosis* or amblyopia. They deal for the most part either with conditions that more or less interfere with exercise of vision by the patient or with the application of tests by the surgeon, such as spasm of the orbicularis, photophobia, copious lacrymation, vertigo compelling the patient to close his eyes, and the like.*

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[61] Witt de Witchel. American Journ. of the Medical Sciences, 1868, p. 382.

[62] Keyser. The Dental Times, Oct., 1870, and Virchow-Hirsch's Jahresbericht, 1872, Bd. ii., p. 575.

[63] Salter. Med. Chir. Transactions, 1863, p, 355, and Guy's Hospital Reports, 1868, Bd. xiii., (compare Wedl, p. 170).

[64] Sirletti. Dental Cosmos, 1878, p. 685.

[65] Lardier. Rec. d'ophth., 1875, p. 86.

[66] Mengin. Rec. d'ophth., 1878, p. 324, and 1880, p. 20.

[67] See Deutsche Monatschrift für Zahnheilkunde, 1884, p. 87.

[68] Widmark. The Lancet, 1886, Bd., ii. p. 88.

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* Lately I have had to deal with an instructive case of amaurosis, which, if not simulated, was probably of hysterical nature.

A girl, 15 years of age, was brought to me on Feb. 14, 1894, with the following history:—She was awakened one morning, some nine months ago, by violent pain behind the left ear. At the same time she found that the sight of the left eye was defective, that objects looked too small, horses resembling dogs, and so forth. A fortnight later, she attended one of the London Ophthalmic Hospitals, where she has been treated ever since, although without any benefit as regards the sight of the left eye.

The patient volunteers the statement that she is always "very near to tears," and she gives a distinct account of other hysterical symptoms, such as a ball which rises in her throat (*globus*), and painful spots about the scalp and head.

R. V. 6/12 & No. 2 Jaeger.

L. V. No perception of light.

Pupils of medium size, equal and active.

Beyond a small congenital crescent of each optic disc, the fundi were quite normal.

Knee-jerks present, and not exaggerated; ankle-clonus absent.

No special test instituted for the detection of simulation.

An absolutely good prognosis given, and the patient handed over to Mr. J. H. Burroughs, for the purpose of having some decayed teeth extracted. The same afternoon nitrous oxide was administered, and the left upper first molar, together with the left lower first molar, removed.

February 15th. The left eye is now able to tell light from darkness and to distinguish movements of the hand. According to the girl's statement, the improvement in sight was noticed as soon as she recovered consciousness from the anæsthetic administered yesterday. As to further treatment, a needle puncture was made in the skin of the left temple, and the patient informed that a potent drug was being thrown into the circulation.

Feb. 20th. L. V. 6/36 and 12 Jaeger, fluently.

Feb. 24th. The girl says that an aching pain affecting the right brow set in on the 20th, and that the sight of the right eye commenced to fail two days ago.

R. V. 6/36 and 8 J.

L. V. 6/18 and 10 J.

An "injection" made into each temple.

Feb. 27th. Gas again administered, and the first right upper molar and two roots of the first right lower molar extracted.

Examined after the operation: R. V. 6/36, L. V. 6/12 ij letters. The visual field for white contracted on both sides; indeed, as regards the right eye it extended only 10°—15° from fixation point. Colour vision normal. No ophthalmoscopic change.

Thus far the cases quoted have referred to simple, that is undefined, amblyopia. But Metras,[69] one of Galezowsky's pupils, goes further, and particularises on the matter. He records two examples of *Asthenopie nerveuse*, in which the seat of disease must have lain in the retina, since the accommodation was perfect. Both were cured by the removal of decayed teeth. Mengin,[66] another of Galezowsky's pupils, publishes an analogous case. This nervous amblyopia appears

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March 3rd. Condition of eyes unaltered.

March 10th. The patient, who was led into my consulting room, avers that, on waking yesterday, she discovered that she was absolutely blind. On the other hand, the lady in charge of the case, states that yesterday morning, when the child thought nobody was looking, she was observed to arrange spoons in the breakfast cups.

Even perception of light denied. The pupils, although small, are equal and active. Fundi normal. Both eyes are obstinately directed downwards and to the right. When told to look at her own outstretched hand, the girl looks everywhere else. Punctures repeated.

March 15th. The patient walks unaided into my room, and states that the sight returned suddenly on the 13th instant, *i.e.* two days since. R. V. 6/36 L. V. 6/24. The visual fields are concentrically contracted to within 5 degrees of the fixation point. Fundi normal; pupils equal and active. Punctures repeated.

March 28th. The patient to-day complains that objects "look small," and that she is suffering from pain in the brow.

April 4th. The sight of the left eye has again failed to some extent. R. V. 6/36, L. V. 6/36. Normal fundi. Pupils equal and responsive to light and to accommodation. Colours readily distinguished. Visual field for white as already noted.

After the above note was made, the patient was lost sight of.

The foregoing history illustrates the *post hoc ergo propter hoc* fallacy that underlies many cases of so-called dental amblyopia. A neurotic patient, we will suppose, without any obvious reason loses the sight of one, or it may be, of both eyes. As a last resource, carious teeth are extracted, and sight is forthwith regained. It is argued, therefore, that the amblyopia results from a dental reflex, which is broken by the removal of its originating tooth. Unfortunately for this assumption, one knows that such cases may be cured in a variety of ways, as by painful faradism, suggestion, and so forth. In point of fact, it is highly probable that the strong mental impression made by the operation, or even by the administration of an anæsthetic, has more to do with the result than the interruption of a more or less shadowy dental reflex.
Trans.

[69] Metras. Rapport path. de l'œil et des dents par action reflex. Thése de Paris, 1873.

to be due to an exalted sensibility of the retina, whereby its functions became quickly exhausted. To that extent, then, it is a more intelligible affection than simple amblyopia. This form of asthenopia is closely related to, if not actually identical with "Anæsthesia Retinæ" the symptoms of which are as follows :—sensitiveness to dazzling light; lowered visual acuity (more apparent when the examination is conducted under reduced illumination); concentric contraction of the field of vision (which varies in extent from time to time); and negative ophthalmoscopic signs. Mengin (*loco citato*) gives a careful account of just such a case in a dress-maker, 34 years of age; while Teierlink's[8] fourth case, which he classes as "amblyopia irritativa," and in which central and peripheral defects of sight were noted, appears to belong to this class. I have recently had the opportunity of observing anæsthesia of the retina in a boy. In that case, fully described below, the ocular symptoms were associated with extreme sensibility to pressure of the whole left half of the head, i.e. from the lower jaw to the vertex. These are the facts :

A boy, aged eleven years, suffered from slight photophobia and, when placed three metres from Snellen's test-type, declared that he was unable to distinguish even the largest letters. After I had promised him a piece of money, he read (with difficulty and frequent breaks) $\frac{3}{9}$ with the right and $\frac{3}{6}$ with the left eye, but neither line was perfectly seen. He then complained of red specks upon the test-type. The right visual field was normal in its extent, but the field of the left eye was considerably curtailed in a downward and outward direction. Results of ophthalmoscopic examination negative; considerable hypermetropia noted. Investigation directed to the teeth disclosed the presence of a fragment of a milk-tooth which was very tender, wedged in between the first and second molars of the left half of the lower maxilla. The neuralgia, red sight, and photophobia disappeared as soon as this fragment was removed, an operation attended with little difficulty, since it was only loosely attached to the gum. Fourteen days later, the lad again presented himself, when the condition was as follows :

Vision of right eye = not quite $\frac{6}{12}$ Hm. $\frac{1}{48}$ V. = $\frac{6}{9}$
Vision of left eye = not quite $\frac{6}{12}$ Hm. $\frac{1}{60}$ V. = $\frac{6}{9}$

The right supraorbital nerve was irritable, on that side the second molar of the lower jaw was coming through the gum. The fields of vision were normal.

The so-called Anæsthesia Retinæ is *par excellence* a reflex trouble, which, generally speaking, attacks women and children, It is concerned with irritation rather than with depression or the retinal functions, and is often associated with trauma or with nervous symptoms, such as hyperæsthesia of the cutaneous nerves, and the like. Now it is precisely this Anæsthesia retinæ which has furnished the largest contingent of cases to the literature of dental amblyopia. But in consequence of superficial examination, not always conducted in accordance with strict scientific principles, the exact nature of the disease has been overlooked, and the cases described as instances of simple amblyopia.

(*To be concluded*).

ELECTRIFIED WATER.

From many observations and experiments M. Ph. Lenard finds that drops of water falling upon water or wet bodies generate electricity, the water becoming elecrtified positively, and the air escaping negatively electrified from the foot of the fall. Light impurities in the water diminish the effect considerably. The essential conditions of electrification are the concussions among the drops themselves and against the wet rocks, no effect being due to the water's fall through the air and its dispersion by it. A jet of water falling from an insulated tank to an insulated pail electrified the latter positively, while the negative electrification of the surrounding air grew to several hundred volts.

British Journal of Dental Science.

LONDON, JULY 2nd, 1894.

CHEMISTS AND CLAUSE III.

The cases, reported in our last issue, of alleged infringement of the Dentists' Act, will have again drawn attention to the possible scope of the penal Clause. Our readers will remember that we have more than once, when discussing dental politics, expressed the opinion that those who were discontented with the existing state of things, would do well to first test the strength of the present Act, before agitating for the passing of a new one. We have pointed out that it is too much to expect that Parliament will sanction the total suppression of unqualified practice ; the most that can be expected is that the unregistered will not be allowed to use certain descriptions for the purpose of leading the public to think they are specially qualified as dentists. Of course we are employing the word "qualified" to include all those whose names appear on the official Register.

Certain magistrates, in different parts of the Kingdom, have recently been invited to express an opinion as to whether the public use of certain words by unregistered men would lead people to suppose that they were qualified dentists. These proceedings in the police courts have resulted, as yet, in a unanimous view, manifested in the unmistakable form of infliction of fines. As we showed when discussing the first prosecution at the beginning of the year, perhaps the most important result was the inclusion, under the wording "any name, title, addition, or description implying that he is registered under the Act," of the application of such title not to the individual, but to the place of business. If the "place" could be brought under the Clause it seems clear that, *a fortiori* there could be little doubt as to the illegality of the assumption of more or less peculiar titles by the individual. The unanimity of the magisterial mind has not, of course, met with universal approval. It so happens that one of the three last cases investigated was that of a chemist whose name was not on the Dentists' Register, but who had bought the business of another chemist who was so registered. We need not go into the question of this transfer, nor into the details of the prosecution, but an interesting aspect is attaching to the case in another respect, inasmuch as one of the organs of the drug trade has published a leading article upon the present interpretation of Clause III of the Dentists' Act. Just now, the pharmacist is being subjected to criticisms from the medical camp, owing to the frequency with which some chemists undertake the responsibility of prescribing as well as of dispensing. Then again, there has been some unpleasantness with the Royal College of Veterinary Surgeons, although it would appear that in the case of a "veterinary-chemist" the publication above alluded to has reason for congratulation. Indeed, it may be that such success has stimulated *The Chemist and Druggist* to suggest a test-case being taken to a higher Court in order that the latest interpretation of Clause III shall be confirmed or contradicted. In constituting itself a champion of whatever dental rights a chemist may possess, *The Chemist and Druggist* commands our respect, especially as the suggestion is accompanied by an offer of financial support; and provided it is clearly understood what claim is to be made on behalf of a chemist who is not also on the Dentists' Register, we are not disposed to say anything which might spoil a good legal fight. Perhaps we can scarcely expect a case on all fours with the "veterinary-chemist," although even that might be possible.

But whether the case is to be that of a "dental chemist," or one in which the objectionable word is used as some other "part of speech," instead of as an adjective, there are, we imagine, a few of our contemporary's clients who may be expected to withhold subscriptions from a defence fund. We believe that the astonishing number of over 2000 persons entered their names on the original Register as "in practice (with pharmacy) before July 22nd, 1878." Although it was found that the names of some four hundred of these were not on the Chemists' and Druggists' Register, and although in the lapse of time the proportion of chemist-dentists has naturally decreased, we know that some are carrying on practice in an honourable manner; and it may be expected that such would prefer that the present construction being put upon the words of the Dentists' Act may be found to hold good.

TRIGEMINAL NEURALGIA.—A case is narrated in *The Lancet*, by Dr. Hedley, of severe paroxysmal neuralgia of the second and third divisions of the fifth nerve. The patient, a man aged fifty-three, had suffered for about four years. Galvanism and the internal administration of Indian hemp had given some relief, but, later, neither this nor other drugs were of any avail. During a paroxysm the patient made strong pressure with his thumb over the mental foramen on the left side. Examination failed to discover a dental cause, and the continuous current was then applied without success. By insulating the patient, however, and "taking sparks" from the points of greatest pain relief was obtained, but only for a time. The left lower wisdom tooth was extracted at the patient's request, but half-an-hour later the pain returned with much increased violence. Two days afterwards the hydro-electric bath was used at a temperature of 98 deg. F. for fifteen minutes with striking results. The baths were continued daily for a week, and for the last two months the patient has been free from pain. The important questions are, How long will the immunity last, and how far will the same procedure be successful on recurrence?

BROMIDE OF POTASSIUM.—In a paper on therapeutic progress and success, Dr. Gordon Sharp says that, although many practitioners do not appear to like it, bromide of potassium has proved a valuable addition to our drug list. He thinks the doses have been too small to have effect, and that it is non-toxic, and may be given in very large doses. A child aged six months can take ten grains repeatedly without showing signs of toxicity, and one aged fifteen months, suffering from convulsions due to teething, may have twenty grains every hour until the convulsions subside. When combined with morphine, bromide of potassium is useful for neuralgia of the fifth nerve in the adult, and Dr. Sharp thinks that the bromide perhaps plays the most important part, for the other halogen compounds are also good in neuralgia of the fifth. He recalls an old prescription for such a condition, consisting of about twenty grains of chloride of ammonium, and ten, or fifteen, minims of Liq. Morph. Hydrochlor.

Laminectomy.—This is the term which is now used to describe the operation formerly known as "trephining the spine." Mr. Thorburn, in a lecture at the Royal College of Surgeons, when estimating the mortality following the operation, points out the difficulty of deciding how far the issue in each case was due to the surgical interference and how far to the injury. Taking the cases where relief was attempted for tuberculosis as the best test as to the danger of laminectomy, Mr. Thorburn finds the true operation mortality is about 20 per cent. Taking the statistics of a few surgeons who have reported all their cases, he finds that out of 70 there were twelve deaths which were due to or hastened by the operation, a per centage of 17·1. In the great majority of these selected cases the cause of death was shock. Hæmorrhage, which was formerly feared so much, is rarely serious, and septic troubles are practically absent. Amongst other interesting points the lecturer also referred to the question as to possible repair in the structure of the cord itself, an occurrence which must be considered impossible.

WHAT IS DENTISTRY?—From certain signs of the times, it appears that some distinct definition as to what constitutes the practice of dentistry is a thing to be desired, however impracticable of attainment. For some it would seem to convey the idea that the Art and Science comprises nothing besides the routine extracting of natural teeth and replacing them with more or less æsthetic and useful substitutes. On the other hand, another School unhesitatingly condems such a practice except as a very last resource, and curls the lip of scorn at the mention of such deeds. Reverting to our recent remarks on Advertising, it may be that the former class will be the last to relinquish scales of prices, inasmuch as their charges are based upon the sale of dental materials, rather than the exhibition of any scientific knowledge. The tooth-saving practitioner, on the contrary, can only point to comparatively small masses of metal and other material which the patient takes away in the shape of fillings, and such a practitioner, if he advertises, must extol his own skill and patience. Midway, between these, sails the bridge-worker, who if he will but restrict his method to suitable cases, can claim that his practice combines the advantages of the other two, whilst avoiding the disadvantages of either.

SCIENTIFIC POLITICS.—In our own Royal Society, the Physiologists form a good representation amongst the Fellows. They may perhaps take some interest in the state of things which now exists in the United States National Academy of Sciences. There the Naturalists number thirty-one whilst the Physicists are in the majority with fifty-eight. The minority wish to elect an additional associate, but, as this is objected to, they have been successful in preventing an increase on the other side. No new members, therefore, have been elected for twoyears, and it is thought the constitution of the Academy will require revision,

Abstracts of British & Foreign Journals.

TEETH BELOW THE MEDIUM.

By Wm. W. Belcher, D.D.S.

What is the most suitable material for these teeth? Gold? How many times in the course of a year you examine mouths studded with soft, frail teeth and find patients completely discouraged; undecided whether they shall continue to have their teeth filled and refilled, or have them extracted. You examine the mouth and find eighteen or twenty teeth filled with gold in which decay has recommenced around the filling. If you are recently graduated, you say, "Fill these teeth with gold, certainly." You talk airily, indiscreetly also, about improper manipulation, and refill with gold. We are sorry for you of course, but more sorry for the patient. If, however, you have been in practice for several years, you have come to the conclusion some time past, that there are other conscientious operators in the world besides yourself, and hesitate for fear of a similar experience. To do nothing unless you know what to do, is practice that will be pursued by every judicious practitioner. Can we diagnose the case before us? I have diagnosed it; it is a case of incompatibility of tooth structure and filling material One of the plastic filling materials is called for. What! not use gold? Yes, in its proper place; in teeth above medium in structure nothing compares with gold as a filling material. It is as durable when properly manipulated as the rock on which the man built his house. Use gold by all means as a filling material when it is consistent with tooth preservation; but in proportion as the teeth fall below the average in density will be the number of failures with gold, though the greater the skill the better will be the result. Our only recourse, then, is a plastic filling.

The successful utilization of plastic fillings depends as much upon specific adaptation of means to ends, as does the successful utilization of gold depend upon manipulative ability. The plastic fillings commonly used are amalgam, cement, and gutta-percha. Amalgam is the sheet anchor for the treatment of soft teeth; it answers admirably most of the requirements of a filling material, its colour alone making it non-applicable to the anterior teeth. In teeth of the lowest scale of density, even amalgam has to take a second place. Nearly every one uses it nowadays more or less. No other material has had such a hard struggle for a place in dentistry. In the early days of amalgam, the better class of dentists waged war against it on "general principles"—it would lower the manipulative skill and professional standing of dentists. Time has brought its own refutation. Never in the history of dentistry has professional standing and manipulative ability been so high as to-day, notwithstanding amalgam has been used as a filling material. It long ago outlived an inherited prejudice, and we are now in danger of going to the other extreme of using it when not indicated.

In filling the teeth with amalgam, the cavity should be prepared with as much care as with gold; edges should be bevelled, and all angles removed. When the decay is deep-seated, and the removal of the decomposed dentine would expose the pulp, it is excellent practice to thoroughly carbolize the cavity, cap with gutta-percha or cement, using great care to have the edges of the cavity free from decay. The enamel should be cut away until the edges become thick and strong. Always have your patient return in three or four days that you may polish the fillings with sand-paper and cuttle-fish disks. This gives the filling a smooth surface and frees it from any overhanging edges. It also adds not a little to its appearance, as it will not tarnish to the same degree as if left rough. Another consideration not to be overlooked is the opportunity to examine your work at your own leisure. Now and then you will find a little fissure you had excavated and in your hurry had forgotten to fill. Quite as frequently you find in spite of all your warnings and the care of the patient, that while in a plastic condition the filling has been fractured. You now have an opportunity of rectifying all this. It is impossible to properly fill and polish an amalgam filling at one sitting.

A new amalgam which has received considerable attention during the past few years is composed of pure copper and mercury. I have experimented with it during the past four years, and in my estimation it is a material of considerable value. It cannot be used in places in teeth that appeal to the eye, as it discolours badly, but in soft teeth, where everything else has failed, I have found it invaluable. It is practically useful in deciduous teeth, being very plastic, and not affected by moisture as other amalgams. I know it is the fashion to condemn this material—"the blackest sheep of them all"—but it has done so well for me, in cases where I had despaired of ever putting in anything more permanent than cement, and had begun to doubt whether the fault was with the material or myself, that I must say a good word for it. One case was that of a young lady for whom I refilled with silver a dozen or more cavities that had been filled a short time before, only to find on her return for professional services six months later thirteen additional places that needed attention, this time not only cavities that had been filled by her former dentist, but also a goodly number of those I had so carefully re-treated. I refilled her teeth, using copper amalgam. A few months ago she was in my office and I had the pleasure of again examining her teeth. Two years had passed since the introduction of the copper ; meanwhile she married and had a child, passing through one of the most trying periods for the teeth. Her health, if anything, was not as good as when I had last seen her, and yet I found but three new cavities. Comment is unnecessary.

I have used the copper only in teeth far down in thescale, structurally, and am sure that I save many teeth permanently which I could only hope to temporarily repair with any other material. I am confident that many of the failures in using this material are due to the fact that it is not mixed thoroughly. There is generally enough mercury, and to spare, in the material as it comes from the depots. It is not enough to heat the amalgam until the mercury appears—the mortar and pestle should be thoroughly warmed. Amalgam so treated is plastic in a surprisingly short time

Cement, as a tooth preserver, stands at the head of the list. As it lasts only from one to three years, it loses much of its value ; still, we occasionally find fillings of this material that have lasted longer, many times in teeth below medium in structure outwearing gold fillings. Great care should be exercised in the use of phosphoric acid to keep it pure, as it easily absorbs water and deteriorates. The powder, if long exposed may bring about the same result. It absorbs moisture from the air, like plaster of Paris, and becomes unfit for use. Cement requires the most careful manipulation to obtain the best results : in fact, next to gold it requires the most skill of any material used in dentistry. I find a six-sided mixing block very handy when in a hurry, six mixing surfaces instead of the two on the ordinary block.

It is a fact that a given amount of acid only can unite with a quantity of powder sufficient to satisfy its affinity, and if there is an excess of powder, the compound formed is brittle, crumbles and admits moisture freely. Apply the rubber dam, mix the powder and acid until you have a creamy mass, trim as much as possible before it sets, and if you are particular, let your patient read the paper for thirty minutes or more before removing the dam. Many coat the filling with sandarach or shellac varnish; but the alcoholic constituent penetrates deeper than could the saliva and does more harm than good.

Dr. Bonwill has suggested coating the filling with heated paraffin which melts at a temperature lower than wax when heated. He claims to get very good results from its use, saying that it renders the filling and interstices around it impervious to the action of acids. Dr. Flagg suggests a mixture of one part white wax to five parts resin. This simply acts as a protective covering for twenty-four hours. I have tried Dr. Bonwill's method, but have not used it long enough to vouch for its preventing the decomposition of the oxyphosphate. Either method seems preferable to the varnishing process.

One of the most satisfactory methods of filling frail or soft teeth is found in gold inlays set with cement. The work requires time and considerable skill, and is necessarily expensive. By this means contours can be restored, having all the appearances of gold with the advantages of cement. For exposed positions, where appearance is an object, this method is *par excellence*. Never attempt to insert and polish an inlay at one sitting. Let the cement harden thoroughly then make a second appointment for the final smoothing and finishing.

Odontographic Journal.

"There seems to be no definite rule governing the interregnum between death of the pulp and the period when this fact is made manifest by subjective or objective symptoms, or both," says Dr. Otto Arnold. This variation in time is due to systemic conditions, depending on the power of resistance or the *vis vitae.*

THE IODOFORM QUESTION.

By W. D. Miller, M.D., D.D.S., Berlin.

If iodoform were proved to be a valuable agent in the treatment of anthrax (although I do not know of a single case of anthrax ever having been cured or even bettered by the use of iodoform), this would not by any means justify the inference that it must be equally valuable in treating diseased conditions of the teeth.

This point illustrates what I must call a serious error that we constantly meet with in dental journals ; that is seizing upon any one fact found somewhere in general pathology or bacteriology, generalizing it and applying it to all possible conditions of the teeth, which often have not the slightest resemblance to the condition to which the fact originally applied. I think that the Duke of Argyll puts it very properly when he says, "We should be awake to the constant liability of even the greatest observers to found fallacious generalizations upon a few selected facts."

The principles of general surgery do not by any means *always* apply unchanged to operations upon the teeth, and much has been written about asepsis and antisepsis, or even asepsis *versus* antisepsis, which a proper appreciation of this fact would have shown to be illogical. The general surgeon has it in his power, in a fair proportion of his cases, to operate upon an aseptic field while the dentist in treating cavities of decay and putrid root-canals, has to work upon infected tissue. The surgeon is sorely restricted in the use of antiseptics because of their action upon the living tissue, while the dentist, in the operations just referred to, is much less hampered by such consideration, and *with proper precautions* can employ antiseptics in almost any desired concentration. Furthermore, the small quantities required by the dentist in operations upon the teeth permit of using antiseptics in concentrations which the surgeon would not dare to think of employing through fear of a general toxic action. The surgeon, again, is usually able to take advantage of the most important factor, drainage, while we, in our operations, except where a fistula has been established, are exceedingly restricted in this particular. It will, furthermore seldom happen that the surgeon will be called upon to treat an abscess through an opening only a fraction of a line in diameter, or to apply his medicaments through narrow and sometimes tortuous tubes like the canals in the roots of teeth.

All this makes the treatment of diseased teeth *in some respects* an operation *sui generis*, and it may not always be permissible to take for granted that methods and materials which have given the best results in general surgery or pathology can be relied upon, unmodified, to give the best results in the treatment of the teeth. When, for instance, one author tells us that he succeeded in curing an ulcer of the leg with oil of cloves where everything else had failed, he is not justified in concluding from this that oil of cloves must be superior to all other medicines in the treatment of putrid conditions in the canals of teeth.

It is true that in my article I might have given more attention to the question of the action of iodoform upon bacterial poisons (ptomaines, toxalbumins), but, as I stated, "it would lead me too far to attempt to consider even a small proportion of the communications that appeared on this subject."

Furthermore, my fourth series of experiments deals directly with the subject, with the result that "the experiments so often turned out in favour of the iodoform, especially where very putrid material had been used, thas its good effects could not be mistaken," a result which I attributed "more probably to a destruction of the poisonous chemical substances in the putrid pulp-tissue" by the iodoform.

Dr. Maxwell would accordingly have found in my own article arguments much more in favour of his position and much more to the point than any results obtained from experiments on anthrax, even if they had been positive instead of negative.

Let us now examine more closely the question of the action of iodoform upon ptomaines in its relation to the treatment of diseased teeth. It was pointed out by Grawitz and Scheuerlen that certain bacterial products, in particular cadaverin, putrescin, furthermore sterilized putrefying solutions from rabbit-meat, sterilized and concentrated extracts from staphylococci, possess the power of exciting suppuration without the presence of the bacteria themselves. The suppuration is, however, wanting in the progressive character shown by suppurative processes where bacteria are present, and where, consequently new quantities of ptomaines may be constantly being formed. I also found and pointed out that suppuration produced by pieces of putrid pulps was always much more severe than that produced by pure cultures of the bacteria produced from such pulps, and I may here add that putrid pulps produce more severe reaction than simply abscessed ones. Behring following up the experiments of Scheuerlen and de Ruyter found that the ptomaine cadaverin, as well as ptomaines which he isolated from pus and infected blood-serum, lost the power to produce suppuration when mixed with iodoform. Although this discovery did not establish the fact that all ptomaines are so decomposed by iodoform, it was looked upon as furnishing at least an indication of the cause of the undoubted beneficial action exerted by iodoform upon suppurating surfaces, particularly when much decomposition was present.

Roysing sharply criticises the conclusions of de Ruyter, and points to the fact that the admixture of iodoform to cultures of virulent pyogenic cocci or to infectious pus does not in any way diminish the pathogenic effects of the material. Also Baumgarten repeatedly seeks to enforce the idea that too much importance is attached to the results obtained by de Ruyter and Behring, and points to the fact that even Brieger was not able to find toxines in pure cultures of pyogenic cocci, and that these organisms are able to produce suppuration entirely without the help of any ptomaines. This celebrated bacteriologist and pathologist (Baumgarten), as well as Kunz and others, emphasize the fact that the iodoform is restricted chiefly to such cases where saprophytic bacteria are present or where putrefactive processes accompany the suppuration. This view agrees with the results obtained by me, for I found that "especially where very putrid material had been used, its iodoform's) good effects could not be mistaken." Schnirer found that iodoform did not appreciably diminish the deleterious action of pyogenic staphylococci and streptococci, or anthrax bacilli, in the animal body. Neisser states that iodoform in the animal body possesses antiseptic action in relation to the bacilli of cholera, anthrax, mice and rabbit septicæmia, but not in relation to staphylococci and streptococci. Jeffries found that iodoform has no devitalizing action upon bacteria, though in some cases he found their growth retarded by it. Tilanus comes to the conclusion, after a study of the more recent communications on this subject, that iodoform has a very doubtful value in the treatment of acute infections of wounds. At the seventh International Congress of Hygiene and Demography (1891) the opinion was advocated that iodoform acts by attracting phagocytes, while in a recent communication to the Academy of Paris Dr. Maurel reports experiments which "tend to show that the action of iodoform can be explained by the fact that it increases the vitality and destructive power of the leucocytes upon the organisms and at the same time diminishes their virulence. Others again ascribe the favourable action of iodoform to its desiccating power. Finally, Baumgarten concludes his remarks with the statement that "this is in full accordance with the fact that iodoform as a surgical antiseptic (in the treatment of wounds), at least when employed alone, has been almost universally discarded."

The above will suffice to show that the question is by no means so simple a one as Dr. Maxfield appears to assume. They also show that the view that iodoform is a remedy which is to be indiscrimately used in all cases of inflammation or suppuration is by no means universal among authorities on the subject.

To return to the dental uses for iodoform, even taking for granted that it has the power to destroy the bacterial poisons produced in diseases of the teeth, what uses can be made of it?

It would be worthless, first, for sterilizing cavities of decay, because it does not possess the power to penetrate the dentine; second, its use in treating exposed pulps would be limited to thecases mentioned in my first article.

The chief question, however, is, What advantage could we take of its antitoxic power in the treatment of putrid canals? Our first endeavour in treating such cases, is to thoroughly remove the putrid matter mechanically; having done this, there will be little need of an agent to act upon the ptomaines. We *do* need an antiseptic, however, to destroy any chance bacteria which may remain sticking to the walls, and which, especially if at the apex, may, by proliferating at any future time, endanger the success of the operation. In case we do not succeed in removing the entire remains of the putrid pulp (let us say that the canal is cleansed only two-thirds of the way to the apex), how does iodoform then act? We cannot sterilize the remaining third by the use of iodoform; but can we render the bacteria poisons contained in the pulp-tissue inert by it? I think we must answer, No, unless we can *thoroughly* incorporate the iodoform with the pulp-tissue in every part, which, in the category of cases under consideration, is extremely difficult and often impossible. Both experiment and experience have demonstrated that iodoform does not possess any penetrating action on a column of dead matter. It was a very common experience at a time when iodoform was indiscriminately used by all for treating all possible cases, to split open a tooth which had been extracted on account of acute pericementitis, and to find the canal packed one-half to three-quarters full of iodoform, smelling as strong as it did the day it was put in.

I am perfectly willing to admit, and indeed must admit in conformity with the results of my own experiments (fourth series), that iodoform thoroughly incorporated with putrid pulp-tissue does *usually diminish* the intensity of the infection caused by it, but the difficulty of accomplishing this incorporation in narrow root-canals, in my opinion, upsets any probable advantage which would be derived from it.

In the treatment of alveolar abscesses, it might be reasonably expected that iodoform would be of service if it could be freely applied ; but to fill the root-canal with iodoform in the hope that it will work through the apical foramen in sufficient quantity to come into contact with all parts of the abscess, would be very like punching a bit of iodoform through a glass tube upon an ulcerating surface or into an abscess cavity, and the successes reported from such use of iodoform when it was first introduced are to be attributed chiefly to the mechanical cleansing of the canal and to the antiseptics employed in connection with the iodoform. (Dr. Maxfield recommends "thoroughly cleansing the parts with some germicide, such as corrosive sublimate solution and hydrogen peroxide," before applying the iodoform. No doubt such treatment would be successful in the vast majority of cases.) When, however, we are able to thoroughly inject the abscess with a solution of iodoform (in glycerin or in alcohol and ether, etc.), I am quite willing to acknowledge the possibility of a favourable action.

Smreker injects an emulsion of iodoform in oil of eucalyptus or in carbolic acid ; he has had no success, however, in torpid cases. Smreker remarks that my conclusions regarding the value of iodoform in the treatment of pericementitis, etc., have turned out a little too harsh. Brubacher uses a paste consisting of iodoform 5.0, salol 3.0, and cacoa butter 10.0. He claims that this penetrates to and even through the apical foramen.

With regard to poisoning through iodoform, which Dr. Maxfield is inclined to doubt, I need only call attention to the fact that in the first year following its introduction, when it was used altogether regardless of quantity, cases of intoxication, frequently ending fatally, were reported by the score, or, as Kolaczek expressed it, the cases were piled up in such a startling manner that König issued an appeal to his colleagues warning them against such an indiscriminate use of the drug. I am not of the opinion, however, and have never expressed myself so, that there is danger of intoxication from the small quantities used in dental practice. This fact, we must remember, applies as well to other drugs. We make constant use of drugs and concentrations in dentistry which on account of their poisonous character have a much more limited use in general surgery. I do not agree with Dr. Maxfield that iodoform has been slighted by the the dentists. There is certainly no material which has been more universally used, though of ten who formerly used it nine may have put it aside for some other drug. This fact, however, resulting from clinical experience, does not speak well for iodoform, at least as hitherto employed in dental operations.

The Dental Cosmos.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary monthly meeting, May 7, 1894. Mr. Frederick Canton, M.R.C.S., L.R.C.P., L.S.A., L.D.S. President, in the chair.

The Minutes of the previous meeting were read and confirmed.

The following members were balloted for and duly elected as members :—Rhys Price, L.D.S.I., 262, Clapham Road, S.W. (resident); Aubrey H. Farebrother, L.D.S. Eng., 3, New Street, Salisbury (non-resident); Walter R. Wood, L.D.S. Eng., 21, Old Steine, Brighton (non-resident).

The CURATOR said he had to acknowledge specimens presented to the museum by Mr. E. Lloyd-Williams and Mr. Oswald Fergus. The model presented by Mr. Lloyd-Williams showed two extremely interesting second lower bicuspids, taken from a boy aged 14, the left one being inordinately large, and very much distorted. One would be glad if possible to find it necessary to extract the tooth, but, unfortunately, it could not be shown from any carious condition that it was absolutely necessary to intervene. The model itself was extremely interesting, and they were very much indebted to Mr. Williams for presenting it. Mr. Oswald Fergus had sent a specimen of a lower molar with a very large crown and disproportionately short and slender roots. There was also a right lower molar, only a small portion of the neck of which protruded from the gum. On the removal of the tooth it was found that the roots were united by exostosis. There was also an upper molar removed, on account of necrosis and absorption of the alveolus over the two buccal roots. Lastly there were three specimens of inordinately-sized roots, which were also very interesting.

The LIBRARIAN reported that the Council of the Royal Medical and Chirurgical Society had willingly consented to exchange their Transactions. He also reported the receipt, by purchase, of the "Atlas of Pathology of the Teeth," second edition, by Professor Heider and Wedl; "Crown and Bridge Work," third edition, by Dr. George Evans; "Official Year-Book of the Scientific and Learned Societies of Great Britain and Ireland, 1894."

Mr. S. J. HUTCHINSON said he had been asked by Mr. James Rymer, of Brighton, to exhibit an extremely interesting photograph of a patient, showing very greatly enlarged central incisors, and also the incisors themselves which he had extracted. He thought members would agree that Mr. Rymer had adopted the right course of treatment. Having first removed the two central incisors he was also careful to remove as much as possible of the anterior alveolar plate, in order to reduce as far as possible the deformity caused by the prominence of the incisors. The particularly interesting part of the case was that the excessive size of the incisor teeth appeared to be due to the gemination of a supernumerary tooth with the ordinary central. He had not made any section across the tooth, not liking to do so without Mr. Rymer's permission, but there was a very obvious line of demarcation up to the roots of both of these central teeth seeming to indicate that a supernumerary tooth had become geminated with the two central incisors. That would not account for the excessive length of the teeth, but it would account very thoroughly for their excessive width. There was a very light portion and two dark portions, and he thought a section through the root of one of those teeth would show either two distinct nerve canals or else a dumbbell-shaped nerve cavity. If that were done it would set the matter at rest. At present they could only get the naked-eye appearance, but on holding the teeth up to the light what he had described would be plainly seen. They were two very interesting specimens, and they were very much indebted to Mr. James Rymer for presenting them to the museum.

Mr. HUTCHINSON also exhibited an electric lamp which had been sent to the Society and which appeared, he said, to be a very effective arrangement. It went up and down an upright and could be fixed at any height. It gave a very diffused light, and the most interesting fact was that there was no shadow of the filament, the shadow being always a detriment to the use of the incandescent lamp.

Mr. OSWALD FERGUS exhibited an apparatus known as the "dental phantom," devised to aid students in the earlier period of their study. At a certain time in their career students were expected, and rightly so, to practise experimental dentistry, though not perhaps on their fellow creatures. This was carried out either by drilling suitable cavities in bone or by putting extracted teeth into the jaws of a vice. Both of these methods were good as far as they went, in giving men a certain amount of familiarity with instruments and materials, but they were deficient in the fact that the student had not the surroundings that he had with the patient, and therefore was perhaps apt to learn bad habits. The appliance consisted chiefly of three parts. There was an upright upon which could be planted two representative jaws, each being fitted with a gutter, and into this gutter the teeth that had been extracted were placed. He would suggest that if the operation of extraction was to be practised the material into which the teeth were to be fixed might be "stent" or some other composition ; for filling, ordinary plaster of Paris would be found on the whole preferable. Almost any operation on the human mouth might be attempted with this appliance. There was in addition an elastic band which went round both jaws, forming an artificial cheek, so that the student was really surrounded more or less with the conditions met with in actual life.

Mr. STORER BENNET drew attention to one point in connection with the dental phantom described, namely, the advantage of the student being compelled to work on the upper teeth without holding the specimen upside down. Of course the difficulty of treating an upper tooth was considerably increased when it was in its normal position with the cheeks obscuring the view. By this apparatus the student was taught to work under those circumstances which were likely to present themselves when operating on living tissues.

Mr. J. F. Colyer brought forward a case of an interesting swelling in the lower jaw. The patient was in attendance and could be examined by members. He was a boy of 17, and the swelling which was on the left side ran from the base of the coronoid process as far forward as the second bicuspid tooth. The outer plate of the mandible was bulged out much more than the inner, the swelling being fairly well defined. On the superior boundary of the border of the jaw fluid could be felt very distinctly. On the inner side there was a fairly globular swelling, presenting a sharp margin of bone, and keeping the finger well beneath there was well-marked fluctuation. He had had the swelling aspirated, and Mr. Nicoll, who very kindly examined some of the cystic fluid, found a large amount of albumen present but no cholesterin. The growth was of eighteen months' duration, and twelve months ago, according to the patient one of the back teeth came out, followed three months afterwards by another molar. The swelling was certainly a cystic one of some kind. It did not appear to be a unilocular cyst, but it was possibly one of those cases of multilocular cystic tumours, or more correctly, epithelial odontomes, the only point against that view being that the patient was rather young.

Mr. Gartley exhibited specimens of lower centrals and bicuspids incrusted to an enormous extent by tartar, and also a good specimen of calcification of the pulp. The patient had had considerable trouble with the tooth for ten years, it having been frequently filled. She complained of sudden "flashes of lightning" going through the tooth, but on examination he could detect no fault with it in any way. For a day or two after refilling it was quiet and then these symptoms came again. At last the tooth became very loose, and he took it out and splitting it open found calcification of the pulp. He added that she had refused to have the pulp extracted from the tooth. He also exhibited a specimen of exostosis in an upper molar. There was a doubt whether it had been a supernumary tooth becoming united with a large bicuspid, or whether it was a separate fang belonging to the tooth. It had no connection with the crown. The bicuspid was all bound up with tartar. A piece of the tartar broke off and revealed the existence of the extra root on the buccal surface. The patient, a lady, had suffered with neuralgia all her life.

Mr. **Bland Sutton** exhibited a carious molar with pus-sac.

The tooth, a first permanent mandibular molar of the right side, had its crown greatly destroyed, and the pulp cavity widely exposed by caries. A pus-sac was connected with each root, but one was no larger than an apple pip whilst the other was as big as a pigeon's egg.

The specimen was removed by Mr. Chas. H. Watson, from a lad 14 years of age. When the boy came under observation he presented the conditions usually associated with alveolar abscess. There was considerable swelling on the right side of the mandible in the neighbourhood of this tooth. When it was extracted, to Mr. Watson's surprise he found this large sac dangling from the root. The sac was full of pus.

It was the largest pus-sac connected with a tooth-root that Mr. Sutton had seen. The specimen was preserved in the Museum of the Middlesex Hospital.

Discussion.

Mr. **David Hepburn** then opened a discussion upon "The Retention of Artificial Dentures in Edentulous Lower Jaws," (See page 577.

The President said the Society was greatly indebted to Mr. Hepburn for bringing this subject forward. It was one that they all took an interest in, and they would be glad to hear any further suggestions of a helpful kind from members.

Mr. **Laurence Read** said the question of leaving a polished surface on velum rubber referred to by Mr. Hepburn, was a matter in which he took some interest, and which he had worked at considerably some six or seven years ago. He had now reduced it to a very easy mode of working, and the difficulty Mr. Hepburn spoke of, which was at one time very great, had been quite overcome. His mode of treatment was to take a large piece of steel wire about a quarter of an inch thick, to make it red hot, and wherever they wanted a rough surface polished to run it along, which took off the rubber, as if it were being fused. If it was then treated with a little chloroform on wool a beautiful polished surface was left, just as if it had been baked on a metal mould. The soft rubber baked at the ordinary temperature was in every way satisfactory. He had had some of these soft rubber linings worn for seven years which were perfect in every way, the patients being delighted with the change from hard rubber.

Mr. Coxon, by means of diagrams on the black board, showed a method of adjusting swivel bolts in such a position as to be absolutely opposite one another. The device consisted of mounting the swivel on a gold carrier which could be moved backward and forward in a socket fastened to the plate. He was going to bring the matter before the Society at the next meeting, but thought it would be well to mention it, as it had some bearing upon the subject of the paper.

Mr. F. J. Bennett said the model shown by Mr. Hepburn and explained by him as representing an oblique condition of the lower jaw, an inclined plane being formed, would, he thought, bear another interpretation. Undoubtedly, as it stood, there was an inclined plane, but he doubted whether, in nature, they ever got a condition, if left to itself, of an inclined plane. If artificial teeth were placed in the mouth it might be so, for the jaws were kept widely apart, but if they were approximated without artificial teeth there was no longer an inclined plane; the lower jaw came up and was perfectly parallel with the upper one. This would give a hint as to how these cases should be treated. Finding that the more the lower jaw was approximated to the upper the less the plane inclined should teach us to make the plates as shallow as possible; in that way the inclined plane was reduced to a minimum. With regard to the drawings exhibited, although artistic, he doubted whether they were altogether anatomically correct. In one of them the ascending ramus was much too high. He wished to refer to the curious condition found as age advanced; the lower jaw became proportionally much larger in its arch, and the upper proportionally much smaller, so that whereas the jaws were tolerably equal in size in middle life, they found in old age a very small upper and a very large lower jaw; consequently the upper plate had to be so arranged that the teeth stood obliquely forward, and the lower plate with the teeth obliquely backward, and that was exactly the condition tending to push a lower plate out rather than keep it in.

Mr. Brunton said there was one point he had been expecting to hear mentioned which no doubt many of the members had noticed ; that was not only the slipping forward of a lower denture, but where springs were worn, also the twisting round. The upper denture would twist in one direction and the lower denture in the opposite direction. He had seen such cases. He himself very seldom used spiral springs, but he had seen such cases occur, though happily not in any dentures that he had himself constructed. It occurred to him that the reason of this twisting round was that the two spiral springs were both coiled in the same direction. Possibly if spiral springs were made, one coiled in the one direction and the other in the opposite, they would not get that twisting. He had never himself tried the experiment of making right and left coiled springs, but he had mentioned it to some of those who supplied springs, and he asked whether some such plan could not be adopted.

The President said he had himself seen cases similar to those alluded to by Mr. Brunton. They were cases which had been worn for a great many years and the cause of the twisting appeared to be that the absorption of the alveolus at the sides left the plate impinging on the palate in the middle. He had never seen twisting occur in freshly made plates, but only where they had been worn for a very long time.

Mr. Vice said he had a case only last week similar to that referred to by Mr. Brunton. The case had been worn for a long time ; the lower arch had very much bulged until the lower piece would not fit at all. The lady dated the movement round to the left side only from her having a new spring on the right side, and she probably was correct in ascribing it to a new spring on the right side, the old weaker spring being retained on the left. There certainly was some difference in the strength of the springs and there might have been a tendency to twisting, and the new spring had accentuated it. That might be the reason more than the fact of the spirals being in the same direction.

Mr. S. J. Hutchinson, referring to the loose membrane which was sometimes rather troublesome in fixing a lower plate, mentioned that in one or two cases of that kind which bothered him for a long time, he took a pair of scissors and snipped off the loose mucous membrane from the surface of the lower jaw, allowed the wound to cicatrize, and in that way got over the difficulty most completely.

Mr. Baldwin said he once met with a case in his practice which presented several interesting features. It was a case of an edentulous mouth to which artificial teeth had been fitted. The lower piece always hurt very much, not because it slipped forward, but because it would move about so much. There were absolutely no alveolar ridges left. The alveolar process had been absolutely removed by absorption, or if not absolutely, all that was left was that part to which the muscles, the mylo-hyoid and the genio-hyoglossus had formed an attachment. Those muscles seem to have acquired an attachment to the lower portion of the alveolar process because the bone at those situations stood up from the general level of the lower jaw. The mylo-hyoid ridge stood up vertically on the inside of each side of the mandible as a very sharp thin ridge of bone, and the genio-hyoid tubercle stood up as a pinnacle in the centre of the back portion of the mandible. The movement of the plate was so great that it was almost impossible to prevent it striking against these prominent portions of bone. It was an interesting point that these muscular attachments were so preserved when there was the greatest possible removal of the rest of the alveolar process. The case presented itself in a vigorous man of not more than 60. The upper jaw was equally flat and destitute of alveolar process. He had been wearing artificial teeth for a great number of years, and the giving of the alveolar processes work by this means had not conduced to their preservation. The muscular attachments, however, had been absolutely preserved. Another interesting point was that velum rubber was tried as a lining for the plate, and although the velum rubber hurt the prominences less than the hard rubber, the patient eventually had to give up the velum rubber because he was so much annoyed by the constant tendency he found to champ his jaws together and compress the velum rubber. This so annoyed him that he had to ask for the velum rubber to be taken away. A third interesting point was that after almost everything had been tried to make the patient more comfortable, a much larger measure of success was obtained by setting up the artificial teeth very carefully on a Bonwill articulator, paying particular attention to some of the practical points on which Mr. Bonwill laid stress ; that was to say, taking care to have the line of articulation of the two rows of back teeth bending decidedly upwards, and again to set up all the teeth on the movable articulator in such a way that in almost all possible movements of the jaw the lower denture would strike the upper one at three points at once. It required a good deal of care to put up and set the artificial teeth in the articulator so as to fulfil that requirement, but it could be done. If a set were carelessly articulated it would be found on moving the lower jaw about the artificial teeth constantly would strike on only two points at once, and so the lower plate got considerably dislocated out of its normal position. It was possible by paying attention to the practical points on which Mr. Bonwill insisted, to put them up so that in all possible movements the lower teeth should strike the upper teeth always at three points at once.

Mr. W. A. Maggs said reference had been made to one of the diagrams, and he wished to point out that in the diagram of the mandible at birth the mental foramen was represented to be very much higher up that it should be. At this period of life the lower jaw consists practically of the alveoli of the teeth, the basilar portion being developed later. He thought, perhaps, Mr. Hepburn was inclined to lay a little too much stress upon the mandible itself. It always occurred to him (Mr. Maggs) that the articulation of the jaw was responsible for the forward movement in edentulous persons; and the fact that the *eminentia articularis* in aged skulls was said to be much diminished would tend, of course, to the free movement of the mandible. No doubt the articulation in edentulous jaws becomes very lax; the ligaments give way considerably owing to the tendency of the lower jaw to meet the upper in mastication; and if a sufficient number of aged skulls could be examined a considerable difference might also be found in the neck of the condyle, and probably in the condyle itself. He thought continuous pressure was a good deal responsible for the great absorption of the mandible frequently seen, and in the case referred to by Mr. Baldwin, the wasting of the jaw might have been aggravated by the continuous wearing of the denture. They all knew that continuous pressure produced absorption, and he believed that if dentures were not constantly worn the tendency to wasting in the jaw would certainly be diminished.

Mr. Badcock recommended the adoption of plaster for taking models in such cases as had been referred to. He said that models taken in the ordinary way with composition would show a ridge all round. The muscles were depressed at their attachment to the bone and the model showed a ridge. If, however, a model of the same jaw were taken in plaster of Paris they would not find the ridge. Where an impression was taken in gutta-percha or composition and the case was made, sore places were apt to arise both on the inside and outside of the jaw. This was entirely overcome by taking the model in plaster. It was, no doubt, extremely difficult very often to get a plaster model in the case of an old person, but it was well worth the trouble. With regard to the use of the hot iron on velum rubber, the whole secret was to have the iron hot enough. If it was red-hot it gave the polish described, and a red-hot poker would be found an excellent substitute when nothing else was handy.

Mr. R. H. Woodhouse said he did not think the discussion ought to pass without some allusion being made to the extreme importance of preserving the natural teeth. The sorrows and difficulties described had arisen very often from the reckless destruction of natural teeth. They knew that the alveolus was so subservient to the presence of the natural teeth that the retention of even one tooth if prolonged, might save all the trouble that had been described that evening. They should, therefore, take every possible means to persuade their patients to bear a little with some of their natural organs. Patients might say, "Oh, the tooth is troublesome—out with it" little knowing the trouble that would arise in the future. They frequently found comparatively young patients who had trouble with their natural teeth and wished to have them out, to be replaced by artificial ones, not realising what an immense amount of trouble and sorrow they would get for themselves in the future. He therefore often pleaded for the teeth of his patients, begging them to undergo the suffering necessary for their preservation. He remembered a case in which an old lady had been wearing an artificial denture for 20 years with springs. She had reached her 86th year. He took an impression of the mouth and started her without springs, and the extreme pleasure the old lady derived was ample compensation for the difficulty experienced at the beginning.

Mr. Hern, with reference to the muscular attachment referred to at the mylo-hyoid ridge, pointed out that if the tray had a deep rim on the inner side it would tend to drive the muscle down, and they got an incorrect impression. If the denture were so low that the movement of the muscles on the floor of the mouth raised the denture, they would be perfectly certain to have an unstable case; and the same remark applied to a certain extent also to the soft tissues on the outer side of the ridge. With regard to the point brought forward by Mr. Brunton when he referred to having dentures turning one in one direction and the other in the other when springs were used, he had met with one or two cases, but they were those in which he thought the thrust of the swivels was wrong. As long as the denture fitted well the plates were correct, and retained their adaptation, but when the mouth began to change, and the fitting was not quite so correct, then the dentures, the upper or lower, turned round, as a consequence of the thrust of the swivel being inaccurate. It seemed to him that the excellent device brought forward by Mr. Coxon would correct this.

Mr. Coxon said he had omitted to mention that supposing they got a slight soreness in the mouth, by shifting one of those bolts a little bit it could often be relieved without having to cut away, and not only that, but the patients had an opportunity of trying whether they could do without springs. He had often put springs in in that way, and after a time the patient had taken them out and been able to get on very well.

Mr. Betts mentioned the advantage of using a shallow tray and while taking the model, of asking the patient to protrude the tongue. This effectively modified the impression as to its depth, and the resulting denture was more comfortable.

Mr. Storer Bennett said after the exceedingly able way in which Mr. Hepburn had introduced the debate he had only to draw attention to one anatomical point to which Mr. Hepburn had alluded in regard to the specimens on the table. In going through the museum they saw certain variations in the height to which the *eminentia articularis* was raised. Mr. Hepburn considered that a good deal of the forward movement of the lower jaw in old people was due to the fact that the *eminentia articularis* became very much lower than in adult life. Before it went forth on the authority of the Society that such was admitted as an established fact, a certain reservation should be made. He did not think that in reality the variation in the *eminentia* was by any means sufficient to account for the variation in these movements of the jaw. They must remember the articulation of the lower jaw with the skull was by no means that of the two bones coming together, but of the lower jaw articulating into the inter-articular-fibro cartilage.

Looking at some very old skulls in the museum, in some instances it would be seen that there was a certain shallowness of the *eminentia ;* in others it was quite as high as usual and in one specimen of a woman said to be 93 when she died, the *eminentia* was as high as in any adult skull. Therefore, although there might be some slight flattening of the bone, they ought not to allow the statement to pass unchallenged that had any large share in the protrusion of the lower jaw. The protrusion was probably due more to the fact of the ligaments becoming exceedingly lax in old age. The relaxing of the ligaments had—in his opinion—very much more to do with it than any absorption and flattening of the bone itself.

On motion from the Chair the thanks of the Society were accorded to those gentlemen who had brought forward casual communications, and to Mr. Hepburn for introducing the discussion.

APPOINTMENT.

Chas. W. Glassington, M.R.C.S., L.D.S. Edin., has been appointed Dental Surgeon to Westminster Hospital, *vice* E. Lloyd Williams, M.R.C.S., L.R.C.P., L.D.S. Eng. resigned.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the British Journal of Dental Science.

Sir,—Now that the attention of the Medical Council is to the front with respect to registered and advertising Dentists, I should like to know how certain names are got on the Register. The latest date so far as I can ascertain from reliable sources for registration was July 31st, 1879, excepting in the case of those whose indenture of apprenticeship was unexpired. On referring to the 1893 issue of the Register, I find there several whose date of registration is very many years later. Here are a few:—1890, February 11th; 1891, March 3rd, April 30th, July 21st, July 22nd; 1892, December 5th. All these are simply, "In practice before July 22nd, 1878." Seeing they omitted to register at the proper time, how have these names got on since? Again, look at the number of so-called American Dental Associations or Institutes. What proof have the Council that these men or their representatives are registered, seeing no name appears? Any Dentist, registered or not, could start one of these Associations.

Yours truly, ENQUIRER.

Erratum.—In the last issue of the Journal under the heading of the list of successful candidates of the Faculty of Physicians and Surgeons of Glasgow, the name A. E. Lepperson should read A. E. Apperson.

British Journal of Dental Science.

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PROSTHETIC APPLIANCES TO REPLACE LOSS OF BONE.*

By M. Michaels.

Amongst the results following the surgical or accidental removal of the jaw, we may mention:—deformity of the face and of the buccal cavity; the impossibility or trouble of masticating, the escape of saliva which may lead to premature wasting, troubles connected with speech and deglutition, etc.; without referring to moral and intellectual disorders resulting from the physical infirmity and which may lead to mania or melancholia.

These complications have seemed sufficiently important to certain surgeons as to lead them to give up resection of the jaw, which is besides of modern date, for the first attempt of this kind is attributed to Anthony White, of London, in 1804.

However, thanks to the progress in prosthetic dentistry, one has succeeded in mitigating these conditions to such an extent as to reinstate this operation.

Now, a long experience having shown us the occasional doubtful results of ordinary prosthesis in the majority of cases, we took the opportunity in the following instance of rying a new departure. Let us first reproduce the notes which we owe to the kindness of M. Tapie, interne to Dr. Péan.

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* Communicated to the Société d'Odontologie.

Resection of six centimetres of the Lower Jaw, Restoration of the lost substance by means of a metal bridge.

Sarcoma of the Lower Jaw.—Louise F., æt. 20. Father, mother, two brothers, and two sisters, in good health. Patient has had no previous illness, except sciatica two years ago. A tumour the size of a filbert appeared within the last twelve months, situated upon the left inner surface of the lower jaw opposite the bicuspids. Three teeth were extracted at the dentist's. A month later, in January, 1891, M. Berger, of Lariboisière, made an incision into the tumour. The wound rapidly closed. On July 29th, by M. Lucas-Championnière, incision and scraping. Fifteen days later the patient was able to leave the ward. Soon afterwards, reappearance of the tumour which, in December 1892, formed a projection opposite the second and third permanent molars. It was ulcerated at the point operated upon, and extended from the canine to the wisdom tooth, making a uniform enlargement on the inner surface of the jaw. It was not smooth and regular like an alveolar abscess, but many-lobed. It was hard to the touch, and of the consistence of an osseous sarcoma or fibroma, its limits were ill-defined, the bony walls were raised, but there was no parchment-like sensation.

Operation on December 10th, 1892. An incision along the lower border of the jaw. Reflection of the periosteum which is healthy. The external table, raised by the tumour, smooth and white is now lifted up and discloses the tumour which has its origin in the cancellous bone. The tumour is reddish-grey, of sarcomatous consistence, it is removed as well as the internal table of the jaw, and the resection of the horizontal portion extends from the ascending ramus behind to the canine in front. At this level the inclination of the section of the bone is slightly oblique from above downwards, and from before backwards.

Histological Examination.—Sarcoma.

A month later healing was complete, but the patient, deprived of one of the rami of the lower jaw, came into the International Hospital, January 6th, to prepare for a restoration. This large loss of substance established a distinct and troublesome interference with articulation between the upper and lower dental arches. Mastication was impossible and speech very defective, the patient was scarcely able to make herself understood. M. Michaels proceeded under chloroform, on January 31st, to extract several carious teeth, the two canines, incisor, and three molars. M. Péan, taking a lively interest in his patient on account of her youth, and her unhappy condition, was anxious to place her under my care. Examination showed me that, following the resection, the right body of the jaw was very movable and irregular in its movements. There was so much deviation to the left as to disfigure the patient. The operation wound had left some turgidity. The mouth was in a very bad state ; an upper artificial case carried seven or eight teeth, the roots of the missing teeth were left behind, very carious, covered with hypertrophied gum and complicated by alveolo-dental periostitis. The only sound teeth in the upper were two bicuspids, one on each side, and the two central incisors. There were five healthy teeth in the body of the right lower jaw, two incisors, the canine and two bicuspids. The cicatrix of the preceeding operations having contracted and brought the two bony fragments together, no articulation was possible. The resection, I may repeat, had extended to a length of six centimetres. The line of the saw behind had cut the angle of the jaw obliquely, the anterior section passed through the canine depression and slanted slightly from above downwards and from before backwards.

The ascending ramus, much displaced inwards by the constant contraction of the muscles of mastication, had produced a twisting of the articular ligaments; a painful condition of the necessary movements for mastication and deglutition resulted, especially as the retracted buccinator muscle was squeezed between the bony fragments and the molar in the upper jaw. In such a condition the patient could take only liquid nourishment, having no power to masticate.

Convinced by this examination of the futility of applying a denture, on account of the instability of the bones, I informed Dr. Pean of the slight hope that I had of succeeding in this way; and he then recommended me to consider the possibility of restoring the jaw itself. We know very well that the bones tolerate the presence of metallic bodies, but still the solution seemed difficult and took some time.

The *desideratum* seemed to be to give back to the jaw its original length and shape, so as to bring the fragments into their normal position in a fixed and immovable manner by the help of a piece in close contact with the bone and resting in the tissues, whilst affording leverage for the muscles which move the jaw. Then, once this restoration succeeded, one would proceed, it must be well understood, to apply such an artificial denture as would be indicated.

So I thought I would replace the missing part by means of a metallic piece, which would afford the greatest strength and resistance with the least amount of metal used, which could be adapted at once by being screwed through the bone itself at conveniently chosen spots, avoiding hurting the cancellous bone too much for fear of setting up osteitis. Now, no one, to our knowledge, has had before the idea of restoring its natural length to the jaw and making a restoration by a metal bridge in the tissues. Nevertheless I decided to try the operation. With a compass I measured the distance between the external meatus of the ear and the mental symphysis on the right side of the face, and I applied this measurement to a skull which served for a model; then having mounted the lower jaw upon a slab of plaster I cut it to resemble as much as possible the resection done by Dr. Pean.

Description of the Apparatus.—After having carefully considered what kind of thing and what shape would be best for my metallic bridge, I came to the following conclusion. I took some iridio-platinum wire and cut two pieces of a convenient length to keep them parallel, a centimetre apart; in the space between, metal rings were soldered with fine gold; the lower wire was twice as strong as the upper. The form adopted secured an absolute rigidity for the metallic piece. One end of this piece fitted upon the angle of the ascending ramus and presented a double eyelet-hole (external and internal) able to take the same screw; I had taken care to have two other eyelets which enabled me to choose the most favourable spot for a second screw, which greatly helped to secure the absolute fixation of the apparatus to the ascending ramus. The other end was shaped in such a way as to go past the symphysis and adapt itself very accurately to the contour of the mental prominence. Not knowing beforehand what would be the most favourable points in the bone, I was obliged to arrange a series of six eyelet holes near to each other, so as to be able to select the spots which would be most convenient to use for passing the screws.

The piece when completed had the double advantage of allowing easy adaptation of the divided tissues, and of re-establishing the muscular movements by the reunion of the soft parts through the rings of the apparatus. In the centre of this piece I placed a threaded nut with a gold screw two centimetres long. This screw, penetrating, later on, the buccal mucous membrane, was destined to serve as a point of support for the application of an artificial denture. All the gold screws had a round head so as not to hurt the periosteum; further, the head was perforated to allow the passage of an instrument which prevented rotation whilst I screwed the bolts home.

The finished apparatus seemed to me to realize all the necessary conditions, and I submitted it for the approval of Dr. Pean, who was good enough to congratulate me, and we arranged to apply it.

On February 4th, in the theatre of the International Hospital, Dr. Pean had the patient chloroformed after having placed a rolled-up cloth under the neck, which, turning the head backwards, raised the chin, a very favourable position for the operation. Then following the line of the old scar he made an incision fourteen centimetres long, laying bare both bony ends. He dissected away the muscles and periosteum on the ascending ramus. Upon the horizontal portion the division of the tissues reached to the right mental depression. The clearance of the muscles of the lips from the external surface of the chin extended upwards for two centimetres; on the inner surface it was necessary to detach the genio-hyoid, taking great care not to injure the genio-glossus, nor the buccal mucous membrane, in order to obtain healing of the external wound by first intention.

The field of operation was then given up to me. Separating the two edges of the wounds with retractors, I proved that my measurements were good and that my piece would conveniently adapt itself. I then prepared to put it in place.

Operation. It was first necessary to hold the ascending ramus with forceps to allow of my adjusting the apparatus, and to drill the necessary holes for the passage of the screws I took care to slightly cauterize the openings with the thermo cautery so as to destroy any nervous filaments there might be in the diploë. I passed, successively, the first screw, then the second and bolted them. The apparatus was now solidly fixed to that portion of the jaw. It then became necessary to use a considerable amount of force to obtain the necessary separation of the two fragments of the jaw to re-establish the normal arch. That done, the part of the apparatus intended to rest upon the mental prominence was held by two forceps whilst I drilled two other holes through the bone. Then, the screws once in place and well secured with the nuts, I cut off the ends and rivetted them. I also took the precaution of filing the surface so as to avoid metallic edges. My work being finished, Dr. Péan sutured the wound (with Florence horse-hair) and the patient was left to the House Surgeons.

It is needless to add that, during the operation, the most rigorous antisepsis was maintained both of hands and instruments.

It was because of this precaution that one could hope for the tolerance of a metallic apparatus in the middle of living tissues. In the event of reunion we should have re-established the original form of the face and the regularity of the muscular action on each side, in such a manner that the articulation of the jaw would become normal, and besides, we should have an immovable base for the application of an artificial denture.

All went well for seven or eight months, when a re-appearance of sarcoma put a stop to everything. The case was badly selected for the success of the method. It would have been better to commencewith a case of injury or benign tumour, but I do not regret my trouble and my conviction has not changed. In fact, even this case has proved that a cleanly, non-absorbable, apparatus is tolerated in the midst of the tissues, provided it is antiseptic, and it has served as a starting point for a still more difficult restoration, an account of which I beg permission to give to you.

[The other case narrated by M. Michaels was one in which he made an apparatus to replace the upper part of the humerus, including an artificial enarthrodial articulation.]

THE RELATION BETWEEN AFFECTIONS OF THE TEETH AND OF THE EYES.

By Dr. N. Feuer, (of Budapest).

Translated by Sydney Stephenson, M.B., Surgeon to the Ophthalmic School, Hanwell, W.

(*Concluded from page* 598.)

(b) THE OCULO-MOTOR NERVE.

These functional disorders take one of two forms, namely, (a) paralysis, or (b) spasm of the various muscles supplied by the third nerve. A complete paralysis of that nerve, by the way, has not hitherto been observed.

With regard to the intra-ocular branch of the nerve, mydriasis* from paralysis of the sphincter pupillæ has been observed as an outcome of dental trouble by Teierlink,[8] Desmarres,[22] Mengin[66], and Ely.[70] Removal of diseased teeth

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70. Ely. The Medical Record, 1882, p. 258.

* A condition, which may be called *Spasmodic Mydriasis*, is often seen in children. It usually affects one eye, is of sudden onset, and owns no obvious cause. Although as a rule it speedily subsides, it may persist for weeks, and is apt to relapse. Accommodation may or may not be involved. For instance, in the following case both cycloplegia and mydriasis was present :—F. H., 12 years of age, a girl of excitable temperament, was noticed, on December 31, 1893, to have her left pupil widely dilated. She was an inmate of the Ophthalmic School, and, at the time mentioned, was using a certain ointment. It was at first thought that by some mistake atropine had been used in compounding the medicament. The ointment introduced into the eyes of other

quickly caused the mydriasis to disappear. A dilated pupil begets dazzling, and thus, to some extent, reduces acuteness of vision ; the combination of these two symptoms may cause great discomfort to the patient. Furthermore, the ciliary muscle, also innervated by the third nerve, generally participates in the paralysis, so that accommodation becomes affected. This implies that sight for near objects is impaired in Hypermetropes, Emmetropes, and, to a slight extent, even in Myopes. There can be no doubt that many of the less accurately recorded examples of "Amblyopia" were due in reality to paralysis of the sphincter pupillæ and of the ciliary muscle.

According to Hermann Schmidt,[71] however, failure in accommodation is quite a common occurrence, and that altogether apart from dilation of the pupil. He examined 92 dental patients, and found that 73 of them possessed accommodation, the range

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children exerted, however, no mydriatic action; Moreover, one pupil was alone dilated, whereas the remedy had been used to both. On Jan. 20, 1894, these notes were made: the pupil of the left eye, which is 8.5mm. in diameter, has been dilated for twenty days. It possesses absolutely no reflex, either direct or indirect, nor does it act on convergence. Right pupil is 4mm. in diameter, and responds to light and to accommodation. R. V. 6/9 and No. 1J.; L. V. 6/24 and No. 16 J. My colleague, Mr. Sidney Spokes, extracted two teeth, which were sufficiently carious, although not painful. Five days later, condition altered. Reads with left eye No. 16 J., but on the addition of a plus 6D lens deciphers J. No. I. Jan. 31st, left pupil motionless and as large as ever. Reads, however, J. No. 1 without any glass: V. 6/9. 1.5 D. sph. 6/5. Two days later, the left pupil was noticed to be somewhat smaller, and to react slightly to light. On the following day, however, the pupil was again widely dilated and motionless, while V. 6/60 and No. 18 J. After a similar relapse, the pupils finally became equal in size on March 30, 1894, on which date the sight of each eye was normal.

The fact should be added that the patient, who was tested before the onset of the mydriasis, had 1.5 of hypermetropia in each eye. Further, that during the period covered by the foregoing history, the visual field of the left eye was markedly contracted, that of the right being of normal extent. Colour sense unaffected. Fundus normal.

In the case of F. H., then, notwithstanding the removal of decayed teeth, the mydriasis remained almost unaltered for a considerable period of time and finally went away of its own accord.—Trans.

[71] Schmidt. Arch. für Ophthalm., 1868, Bd. xiv., 1 Abth., p. 107.

of which was below normal, either in both eyes or in the eye of the same side as the affected tooth. Of 31 cases, in which the reduction differed in the two eyes, the greater limitation was found in 30 instances to be upon the side that corresponded with the diseased tooth. In 51 cases the contraction was of equal extent in both eyes ; nine persons had bilateral dental disorders. The paresis of accommodation declared itself most frequently in youth ; indeed, it was seldom met with after the 30th year. Among 62 patients, whose ages ranged from 10 to 25 years, reduction of accommodation was in 35 instances equal to a lens of 5D, and upwards. Schmidt considered that the vaso-motor nerves of the eye became involved by the reflex, and that increased intra-ocular pressure was thereby brought about ; the latter factor he held responsible for the diminished range of accommodation.

Schmidt's observations are remarkable in many ways. It is curious, for instance, that paresis of accommodation was so common, paresis of the sphincter so rare ; that the marked reduction of accommodation did not embarass the patients; and, finally, it is difficult to see why those 30 years of age and upwards should enjoy almost complete immunity.

Priestley Smith[42], conducted some control experiments upon patients who were suffering at or about the time from toothache. In one case only, out of the 16 examined, did that observer demonstrate any reduction in accommodation.

It becomes impossible, therefore, to accept Schmidt's statements as they stand, and, in point of fact, his observations leave much to be desired. Leaving wholly aside any considerations as to whether odontalgia can during the paroxysm cause actual paresis of accommodation, it is obvious that a patient racked with toothache can be scarcely expected to use his ciliary muscle to the best advantage. Schmidt himself tells us that he often demonstrated the existence of surplus accommodation, and, further, that repeated examinations of one and the same patient, conducted during the continuance of the pain, frequently yielded different results with regard to the position of the near point.

Schmidt's observations must be regarded as incomplete, moreover, inasmuch as he neither paralysed the ciliary muscle with atropine, nor did he ascertain with the opthalmoscope the condition of refraction, i.e., the position of the distant-point of the eye. Atropinisation, it is true, might have been possible in but few of the patients, owing to the lasting effects of the drug. The ophthalmoscopic determination of refraction was therefore all the more necessary, since paresis of the ciliary muscle might at any moment yield to spasm. The latter condition would conceal a latent hypermetropia, or might even appear to convert emmetropia into myopia of considerable degree.

Schmidt alleged that the reduction of accomodation was limited almost exclusively to young persons. Thus, most instances were observed in patients from 10 to 15 years of age, while from 15 to 30 years the condition gradually declined in frequency. Among 13 individuals whose ages ranged from 30 to 40 years, only six slight cases were noted. In six patients, 40 years of age and upwards, the accommodation was diminished once only ; in three of these people it was stated, indeed, to be " better than normal." These results may be explained by the fact that spasm of the ciliary muscle is constant in young persons, whether they be hypermetropic, emmetropic, or even slightly myopic. The omission of ophthalmoscopic examination accounts for Schmidt's failure to exclude this obvious source of error. One further point may be mentioned. Schmidt states that even experienced observers may differ ¼ to ½ inch in their estimate as to the position of the punctum proximum. Such an error, however, would make little appreciable difference in the range of accommodation except when the near-point lies very close to the eye, as, for instance, in young subjects.

To illustrate the influence of toothache upon the accommodation, Schmidt gives a detailed description of the two following cases.

1. Fraulein Elise L., nineteen years of age, came to the out-patient room suffering from violent toothache of three days' duration, which, according to her statement, was "enough to drive her mad." The face was markedly congested, while its right half was tender to pressure. The eyes were injected, a remark that applies especially to the right one. The third molar of the right upper jaw was found to be the starting point of the pain. Myopia 1-80 ; slight divergent strabismus of the left eye; punctum proximum, 4 in. The pulp of the carious tooth was destroyed by means of arsenical paste, with the consequence that the neuralgia disappeared. On the following day the patient being quite free from pain, the near-point stood at 3¼ in. (In spite, therefore, of three days, violent pain, only ¾ difference was observed between the trials, and that is about the same variation as obtains under normal conditions). Later on, odontalgia returned, although not so violently as before, and the near-point was found to lie 3¾ in. to 4 in. from the eyes.

2. Louis P., 20 years of age, had suffered for about a month from considerable pain, caused by caries of the second lower molar of the right side. Acuteness of vision: left eye, 1, right eye, somewhat less. Both eyes, myopia $\frac{1}{60}$. Near-point: left eye, 3½ in., right eye, 6½ in. After destruction of the pulp, toothache was relieved. On the next day, the near-point of left eye lay at 4 in., that of the right eye at 5½ in., the accommodation of the left eye thus showed a reduction of $\frac{1}{82}$, while in the right eye an augmentation of $\frac{1}{36}$ was observed. It will be noted that the accommodation in he left eye was normal during the paroxysm of pain:

and twenty hours after the disappearance of the latter, the diminution observed was somewhat greater than the augmentation noted in the right eye. Nevertheless, Schmidt finds this case particularly instructive.

Lastly, a serious defect in Schmidt's investigations lies in the fact that, of the 73 patients in whom a diminished range of accommodation was demonstrated, so few as eight presented themselves for further examination. Although five of the latter showed improvement as to their symptoms, yet Schmidt relates in detail two cases only, and those, as already hinted can by no means be regarded as conclusive.

In fine, investigations should be made as to whether accommodation is really weakened by toothache, and, if so, in what proportion of cases; further, as to whether such a symptom is, or is not independent of the patient's volition. I may add here that some control-experiments, lately instituted by me, yielded negative results.

Myosis (due to spasm of the sphincter pupillæ) is sometimes caused by dental irritation, although mydriasis (due to paresis of the sphincter) is much more commonly met with. In a case described by Mengin, [66] contraction of the pupil as well as spasm of the accommodation were noted. Also in Teierlink's case of irritative amblyopia, alluded to previously, myosis was observed.

With regard to the extra-ocular branches of the third nerve, we find recorded several cases of ptosis, which rapidly recovered after the removal of diseased teeth, (Hancock,[72], Fox, Gaine[14], Power[32], and Faucheron[41].) For my own part, I was once acquainted with a lady, who, whenever she became pregnant, developed marked ptosis in one or the other eye.

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[72] Hancock. The Lancet, 1859, Bd. I., p. 80.

Terrier [73] described contraction of the superior rectus, external rectus, and inferior oblique of the right eye in a hystero-epileptic girl, 21 years of age, who had several decayed though not painful teeth. Photophobia and blepharospasm were present, so it is possible that the upward and outward deviation of the eye was due to those conditions rather than to a primary affection of the muscles. The ocular disorder, which had existed for four months, disappeared a few days after removal of the diseased teeth.

Ely[70] observed slight paralysis of the right internal rectus and of the ciliary muscle arising from dental irritation, and Mummery [74] and Neuschuller [75] have described similar cases. Mummery's case, detailed below, was a veritable museum of wonders.

A young lady suffered from pain in the left side of the face. The neuralgia was caused by a molar which had been stopped. The eye was divergent, a condition that vanished after extraction of the tooth. Ten months later, pain again made its appearance, entailing this time ptosis and mydriasis of the left eye ; it was also noted that a tuft of hair upon the temple had turned grey. It was found, upon examination of the mouth, that a neighbour of the tooth previously drawn had become carious, and after its extraction the ptosis and the mydriasis disappeared, although the gray tuft of hair showed no alteration.

It is instructive to compare with the foregoing case that recorded by Mengin.[66] A woman, 49 years of age, suffered from face-ache and from contraction of the internal rectus. The latter symptom gave rise to homonymous diplopia. The stump of the first upper premolar tooth of the right side which was scarcely sensitive to percussion, was extracted.

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[73] Terrier. Journ. de Med. et Chir. prat., 1875, p. 549.
[74] Mummery. Dental Cosmos, 1880, p. 561.
[75] Neuschaller. Rec. d'ophth., 1889, p. 657.

Two days later, both the face-ache and the diplopia had completely disappeared.

(c) THE FACIAL NERVE.

That the orbicularis muscle, which is supplied by the facial nerve, participates in tic doloureux is well known. Mengin[66], reports a case of *Tic des deux paupieres* of four months' duration, in a girl of nervous temperament, eleven years of age. The right superior canine and the second molar teeth, which, although decayed and pulpless, were scarcely sensitive to pressure, were removed ; and eight days later, the tic had disappeared.

On the other hand, Salter [63] described a case of facial paralysis following upon a painful caries of an upper wisdom tooth.

Ely [70], records "paresis of the orbicularis with irregular spasm of the ciliary muscle and astigmatism and monocular diplopia," all of which symptoms vanished forthwith after extraction of an upper molar and evacuation of the abscess that lay at its root.

RESUME.

1. Dental affections may cause catarrh of the eyes reflexly, a process observed especially during the first dentition. Catarrh may also be one of the symptoms accompanying a swollen face of dental origin.

2. Purulent inflammation may spread by continuity from the periosteum of the alveolar process to the orbit, and there set up cellulitis. In many cases the latter malady has entailed ruin of the eyes, from atrophy of the opticnerve or from phthisis bulbi ; even death itself has occasionally taken place.

3. A reflex, originating from the teeth, may cause certain functional disturbances in the eye, by affecting the orbital

branch of the trigeminus, the optic nerve and retina (light-perception apparatus), the oculo-motor, or the facial nerve.

4. Affection of the orbital branch of the trigeminus, which is brought about by irradiation, causes neuralgia of its several branches and exalted sensibility of the skin to which they are distributed. It produces, moreover, pains in the eye and in the orbit, together with copious lacrymation. Swelling and redness of the conjunctiva are secondary effects, due partly to excitation of the vaso-motor nerves.

5. Implication of the optic nerve and retina manifests itself by photophobia (which in its turn produces blepharospasm), by asthenopia and anæsthesia, by amblyopia (?), and by amaurosis (?). Also by super-sensitiveness as well as by dulness of the optic nerve and retina respectively, unaccompanied by ophthalmoscopic changes.

6. Affections of the oculo-motor nerve generally show themselves in the form of paralysis of the two intra-ocular muscles, namely, the sphincter of the pupil and the ciliary muscle. In a few instances, however, spasm has been observed. The external voluntary muscles of the eye may also, be implicated. This is particularly the case as regards the levator palpebræ superioris and the rectus internus, the latter of which is of course connected synergetically with the intra-ocular muscles. Of spasm of the rectus superior, and the obliqus inferior, a single problematical case has been recorded by Ferrier, who further stated that the rectus externus, supplied by the sixth nerve, was also involved. No affection is mentioned of the rectus inferior, supplied by the oculo-motor nerve, nor of the obliqus inferior, innervated by its special nerve, the trochlearis.

7. Affections of the facial nerve usually take the form of irritation, evidenced by tic and blepharospasm, seldom that of palsy.

8. Ocular troubles of reflex origin are completely and

rapidly cured by extraction of the tooth from which the vicious impulse radiated.

9. In a few instances, reflex eye maladies have been observed to follow the extraction of a tooth. Such cases were, however, quickly cured.

10. No explanation has yet been given of the curious fact that a peripheral excitation of the trigeminus, often trifling and scarcely noticed by the patient, is capable of causing palsy of other nerves, both motor and sensory.

11. It remains yet to be proved that inflammation of the eye, apart from symptomatic conjunctivitis, can be produced by a dental reflex. Statements to the contrary are not supported by sufficient proof.

DENTAL DISORDERS CONSEQUENT UPON AFFECTIONS OF THE EYE.

At the commencement of this paper it was remarked that actual dental disease caused by affections of the eye had not been observed. At the same time, the fact should be mentioned that the passage of a probe down the nasal duct, which is fed by the anterior dental nerve, not infrequently gives rise to pain in the anterior molar teeth.

Galezowsky[37] records the following case :—A porter suffered from rheumatic iritis of the left eye. In the second week of its course, the malady was complicated by exceedingly violent neuralgia of the teeth. Before Galezowsky saw the patient, a dentist had been consulted, and two sound

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* In this connection, the following interesting case, reported by Ducellier, may perhaps be mentioned. A bullet, weighing 7 grammes, lodged in a patient's right orbit. Little uneasiness was complained of with regard to the orbit, but severe pain was experienced in the right superior maxilla, and especially in the canine and incisor teeth. That these symptoms were the result of pressure by the bullet on the infra-orbital nerve was proved by the effects of treatment. The foreign body was removed, and the dental pain, along with other symptoms, at once subsided. (Rev. d'oph., 1877, p. 355).
Trans.

teeth were removed, without however assuaging the pain. The neuralgia disappeared with the cure of the iritis. And when the iritis relapsed, five months later, similar pains were experienced in the teeth.

Javal [45] speaks of a case of glaucoma in which toothache was a prominent symptom. After the performance of an iridectomy, the odontalgia vanished.

OPERATIVE DENTISTRY.

By Dr. J. C. Brewer, of Blackshear, Georgia.

Cavities in deciduous teeth should be filled with gutta-percha. In the grinding surfaces of molars and bicuspids, the gutta-percha fillings may be capped with an amalgam having a large percentage of tin. For devitalizing the nerve of a deciduous tooth, when this cannot be avoided, we use equal parts of oil of cloves and carbolic acid. We are reminded of the death of a child of seven years of age occasioned by the use of "toothache drops" purchased at a country store. This penetrated through the foramen, necrosis ensued, and in spite of all remedial aid death was the result. The bottom of the small bottle was covered for an eighth of an inch with arsenic. The importance of proper use of the molar teeth in mastication, and the use of food requiring thorough mastication should be urged on all. For permanent fillings we have had very satisfactory results from the use of Daniel's mastic as a lining for large cavities, which forms an impervious coating, closing the mouth of the tubuli, and acting as a non-conductor to some extent. For root-fillings we use cotton saturated with creasote and dipped in oxide of zinc. We do not consider pulp capping good practice, though we have been quite successful in a small per cent. of cases. When there is a thin layer of dentine over the pulp we would fill half or two-thirds full with oxyphosphate.

American Journal of Dental Science.

British Journal of Dental Science.

LONDON, JULY 16th, 1894.

THE CIVIL RIGHTS DEFENCE COMMITTEE.

We have heard, lately, something about the protection of Dentists' interests, and we are aware that there exists a Society for the protection of witnesses in law courts! But the CIVIL RIGHTS DEFENCE COMMITTEE will, we believe, appeal not only to those interested in the above, but to a much wider circle. As is frequently the case, the suffering of an individual is found to benefit the community; but some of our readers may be surprised to find that a martyr was necessary in order that the rest of us may be told that, in the eye of the law, a medical man is no longer a free agent. If, as some think, Dentistry is a special branch of Medicine, then, as the greater includes the less, how will dentists fare, who may have thoughts of holidays, or, say, intervals of rest at the "week end"?

The case which has brought about a discussion, and led to the formation of a Defence Committee, with Lord Stamford at its head, occurred originally in the West Indies. In the Trinidad law Courts, an action of "Marshall and wife *v.* Anderson" resulted in the following decision:—"That a medical man has no right in any case to demand payment before rendering his services, or to take security beforehand for being paid at all, and also that a medical man has no right to discontinue attendance on a case without the consent of the patient, even though he has entered into no engagement to attend for any time certain, and although he may have been rudely treated; and for discontinuing his attendance under such circumstances gave judgment against Dr. Anderson for £10, and disallowed his bill of seven guineas for about three months' attendance, including an operation under chloroform for necrosis of the superior maxilla; although medical witnesses of both parties testified that Dr. Anderson's treatment had been careful and successful; that his discontinuance near the completion of the case had caused no injury to the patient; that he had the right to take the security beforehand; and also to discontinue attendance as he had done; and that his account was fair and moderate." Dr. Anderson has borne the brunt of an important battle. Unfortunately at present he has been defeated, and this in spite of the fact that commissioners who inquired into the matter reported that he had been subjected to judicial persecution. A British jury has awarded him £500 damages, but the late Lord Chief Justice quashed the verdict on the ground that no action can lie against a judge for any act done by him in his official capacity. This is the point of public interest which it is hoped to get settled by properly raised appeals, but "The Civil Rights Defence Committee" also hope to establish, in like manner, a final legal decision as follows:—"1. The right of medical men—as of all other men—to control the disposal of their services, and to make terms for them. 2. The right (not having undertaken any particular obligation) to discontinue attendance on a patient should circumstances appear to render such a course advisable, corresponding to the right of the patient to dispense with the services of his medical attendant."

With respect to the fund which it is necessary should be raised, it has been decided that individual subscriptions shall not exceed one guinea, and in this way the Committee hope that the number of subscribers may have some moral influence. The Royal College of Surgeons of England have appointed a Vice-President and a member of Council, in the persons of Messrs. Macnamara and Tweedy, to represent the College; and the British Medical Association, and other Societies have taken similar action. We think dentists should follow the example.

SUPPURATION OF A SUBMAXILLARY GLAND. An interesting case is recorded in the *Glasgow Medical Journal* by Dr. George S. Middleton. A boy, aged 11 years had been suffering for a week with a small swelling under the lower jaw on the right side, supposed to arise from a bad tooth. He was then admitted into the Royal Infirmary complaining of pain in the front and left side of the chest. The boy was then very ill, and there were dyspnœa and pericardial friction. A considerable swelling extended from the jaw down to the level of the clavicle ; it was fluctuating and red, and continuous with it in the neck there was marked œdema over the upper part of the thorax on both sides of the middle line, with dulness on percussion. The temperature rose to 103·, delirium set in, with rapid pulse and breathing, and the boy died in twenty-four hours. The post-mortem showed a very rare condition. The loose connective tissue of the mediastinum, from the suprasternal notch to the diaphragm, was infiltrated with pus which had insidiously extended, from the submaxillary abscess, below the deep cervical fascia.

DIPHTHERIA AND BAD TEETH.—In a graduation Thesis, Dr. William Watson discusses the effect an unhealthy mouth may have in favouring the occurrence of diphtheria. One of the things he has noticed is that at least 80 per cent. of the children suffering from that disease have teeth badly neglected and gums in a most unsatisfactory state. Slight local suppurations are always going on, and the gland structures, connected with the mouth, suffer. In the neck there is enlargement of the glands, which then form a suitable soil for the development of tubercle. As a further result of this constant irritation there is enlargement and hypertrophy of the tonsils, with consequent evils in the form of constant liability to sore throat, development of nasal voice, and mouth-breathing. Dr. Watson recommends the frequent inspection of the mouths and throats of all school-children and that their teeth should be "put right." The chief object of the paper is to show the satisfactory results gained in treating diphtheria by excision of the tonsils.

A MEDICAL POLITICAL PARTY.—In England there are scarcely sufficient medical members of Parliament to form a "party", but in France, where the Senate and the Chamber contain a larger number, a "medical group" has been organised, with a President and Vice-Presidents. Work has already been done in connection with a Bill dealing with the military service of medical students; and the many points concerning sanitation, medical jurisprudence, and other like matters should certainly benefit by some such organised watchfulness, and combined action.

LENGTHY AFFIXES.—A correspondent writing to the *The Lancet*, and signing himself "Perplexed," is a member of a provident Society. A medical officer is about to be appointed, and one candidate boasts that he has "nineteen letters after his name, and is triply qualified, which is more than any other gentleman in the neighbourhood can say." It is believed that he holds the conjoint diplomas of Edinburgh and Glasgow, and the correspondent wants to know if an M.B., C.M. is not equally well qualified. Not many candidates for dental appointments can get near the nineteen gentleman, but we are progressing. M.R.C.S., L.RC. P.L., L.D.S.R.C.S.I.

POISONOUS CHEESE. A case has recently been reported from the West of England, in which three children aged from four to six years of age, had some green cheese, somewhat decomposed, given to them by a neighbour. In the artless simplicity of their youth, they disposed of it in the usual manner known to childhood, and afterwards became violently ill. They appeared to the doctor who attended them, to be suffering from some form of irritant poisoning. The [effects of the presumed ptomaine were very severe; many remedies were employed, and the children ultimately entirely recovered.

Abstracts of British & Foreign Journals.

THE SIXTH YEAR OLD MOLAR.

By P. P. Spake, D.D.S., Richmond.

The origin of the sixth-year molar, like that of the rest of the teeth is from the outer covering of the oral cavity, or epithelium, corresponding with the skin outside of this cavity. But, unlike the anterior teeth, the prolongation of epithelium which sinks into the jaw and forms the sixth-year molar, gives off later a branch which forms the twelfth-year molar, and from the latter yet another branch which forms the so-called wisdom tooth. Thus, it will be seen that while each prolongation of epithelium anterior to the sixth-year molar forms only one tooth that from which this tooth is derived is the source of origin of three, and these three the largest in the arch. This is a peculiarity not associated with the formation of the other teeth to which I would call special attention, desiring to point out some of the results of this peculiarity.

In the first place, the second and third molars in their origin being offshoots from the first, it is very evident that there can be no second or third molars except there be a first. In the anterior teeth one or another will sometimes be found missing without the loss of adjoining ones, but from the very nature of the origin of the sixth-year molar it could not fail to develop without precluding the eruption of the second and third. Sometimes it seems as if the powers of formation of this epithelial prolongation gave out before reaching the third molar, as is very often witnessed by the absence of the wisdom tooth. But it is not likely that anyone ever observed a wisdom tooth which had no sixth-year molar as its predecessor.

But there is connected with this tooth another striking feature associated with its origin, namely, absence of irregularity. Though any of the anterior teeth are sometimes found out of position, as may also be the case with the dens sapientiæ, probably, this tooth was never seen out of its regular position except as the result of violence, and, according to my observations, it has never been out of position except from injury subsequent to its eruption. The absence of its irregularity is readily understood when we recollect that it, having no temporary predecessor to retard its eruption or change its course, and having the posterior part of the jaw to pick its course, invariably comes out in a normal position. The situation also of this tooth makes it the keystone of the arch, its loss in the adult tending more to cause irregularity than the sacrifice of any other. Being in the centre of the arch, its anterior surface forming the diuiding line on the alveolus between its anterior and posterior halves, it locks the anterior and posterior teeth in position, While, from its location, it is most active in preserving the regularity of the rest of the teeth, its arrangement in that location makes it most active in the process of mastication. This will be understood when we note that in the upper jaw the first molar is the point at which the jaw teeth curve upward and forward. while in the lower jaw the first molar is the lowest point in the curve. Thus when food is placed in the mouth it naturally seeks the lowest point or hollow in the curve, which corresponds with the first molar of the lower jaw, where it is masticated by the upper first molar which points downward farthest in the upper jaw, fitting and crushing the food in such depression. These teeth, therefore, when in their normal position from their arrangement, are forced to do the greater part of mastication, and may be termed the upper and nether millstones of the mouth. The food chewed upon either the front teeth or second and third molars, can be kept in position and masticated only by more or less effort which is not natural, the position which it naturally takes when left to itself being in the depression in the lower arch over the first molar, as mentioned before, where it may be crushed by its superior antagonist. The preservation of this tooth, therefore, is more to be desired from the standpoint of intrinsic value than any other. Notwithstanding that this is the most valuable of dental organs, there are times when its extraction is indicated which will be pointed out further on.

With the single exception of irregularity, the troubles to which this tooth is liable are the same as for the others with the difference that it is more liable to such troubles, and, consequently, its treatment has to be modified with this fact kept in mind. As an example, take caries, to which all the teeth are liable, but none so much so as the sixth-year molar. Evidently, there are some causes why it should decay more readily than any other of the dental organs, and it becomes our duty to search out the causes, so that we may act intelligently in its treatment. In the study of its structure, composition, and the changes which it undergoes at different periods of life, we may get the key to the problem. It is generally acknowledged that early in life, soon after its eruption, it consists much more largely of animal matter than at a later period, when the earthy material has been deposited in larger quantities ; consequently, disorganization, which may be started soon after its eruption, is liable to prove much more destructive than if started later. While it is highly important that this tooth should be preserved for the sake of itself as well as those associated with it, if decay begins very early, say between the ages of six and ten years, and reaches the nerve it is much better to extract at once than attempt at such an early age the destruction of its nerve and root filling. There are several reasons why it is better at this age to extract than fill as a dead tooth. In the first place, at this time the animal matter in the tubuli of crown and roots is in very large proportion, and more liable to putrefactive changes than later, when the earthy deposits reduce the size of the tubuli. In the second place, the tissues of the jaw, like other parts of the body, in the young are more susceptible to irritation than later in life. Thus, an abscess might be produced by an irritating body which might readily be tolerated at a later period. In the third place, if, from the condition of this tooth when it comes under observation, it is seen that it can be preserved for only a few years, it would be best to extract immediately, which operation would give the second and third molars an opportunity to come forward during and after eruption, and fill the space caused by the loss of the first. Though it may be best, as a rule, to save the natural teeth for only a few years, if they cannot be saved longer, the rule will not hold good for this, the most valuable of all teeth, at the early age, and under the conditions indicated. In this manner, such teeth as cannot be saved except for, possibly, a few years are removed from the danger of causing an irregular position of others, which would result if extracted subsequently. To sum it up, I would say that when extraction is unavoidable, it is better to extract at ten than at eighteen years of age. After such an operation the second and third molars will generally fill the space very satisfactorily, which would not be the case if the first molar were extracted about the latter year, with, most likely, an abscess to contend with up to that time. But, where the nerves remain alive, the density of the tooth may be hastened by the use of oxyphosphate filling material in the cavities to be filled in preference to amalgam until such time as the tooth by increasing density from the deposition of lime salts, assisted by the hardening influence of the oxyphosphate material, becomes hard enough for metallic fillings.

It is a fact that has received due recognition that an oxyphosphate filling will either hasten the increase of density of a tooth or increase the density through some virtue of its own. So far, I have never learned whether the oxyphosphate filling hastens the deposition of lime salts in the tubuli of a tooth or of itself acts upon the tubuli of the dentine in immediate contact. But, whatsoever be the mode of action, it has a most desirable effect in hardening the dentine of a tooth in which it is placed. I often use it, intending it to remain for only a year or two, for the sole purpose of hardening the tooth, so that the metallic filling purposed to be used after that length of time may be employed with greater prospects of permanency.

Attention should be called to the first molar as a butt for bridge-work, when the choice lies between it and adjoining roots, for the following reasons:

1st. It is not inclined to change its position in the jaw so readily as the other molars, whose tendency is to work forward or in the front ones to change with slight pressure.

2nd. That it is naturally the point at which the strain in mastication falls, thus becoming the but proper for work of this kind. As all objects have a centre of balance and a point upon which strain falls more heavily than elsewhere, so have the jaws, and this centre of strain corresponds with the location of the first molars. For this reason gold crowns for the first molars should be thicker than elsewhere on account of both wear and strain being greater. Very thin gold crowns here are contrary to reason and the necessities of the case.

Southern Dental Journal.

Professor Frohner, of Berlin, has been investigating the extent to which tuberculosis occurs amongst domestic pets. He found that this disease is rare amongst dogs, somewhat more frequent amongst cats, and quite common in parrots. The frequency with which the latter are attacked is attributed to their being kept almost entirely indoors.

IMMEDIATE ROOT FILLING.

By Edmund Noyes, D.D.S., Chicago.

Immediate root filling may be defined as the filling of roots at the first sitting when anything is done within the pulp chamber or canals, or, if a pulp has been devitalized, filling at the same sitting when the pulp is removed. The subject of immediate root filling has often been discussed with reference to the possibility of it, and the cases in which it can be done without danger of disastrous consequences following, rather than upon the broader grounds of its suitability, convenience, and general utility.

The first two heads, namely, "After extirpation of a live pulp," and "After removing a devitalized pulp," are so nearly alike in their relations to this question that they may be considered together. These cases furnish the most frequent and suitable opportunities for immediate root fillings, and there are no serious objections to them if required by convenience or necessity. However, when we remember that a large proportion of root fillings have to be made in bicuspids and molars, and consider the difficulty of getting away all portions of the pulps from small roots, we often find that root filling "After the removal of all pulp tissue" does not always prove to be so very "Immediate." Probably the recently described methods of cleansing pulp canals by means of kalium natrium, or dilute sulphuric acid, may make the accomplishment of it at one sitting more practicable than heretofore. The objections to immediate filling in these cases (after extirpation is complete) relates to the difficulty of controlling hæmorrhage or exudation, and consequently of obtaining complete dryness of the canals, to the irritability or sensitiveness of the parts at the apex, manifested by severe pain during the introduction of the filling, and which is apt to be much greater if the filling is carried to the apex as it should be, than if it stops short of its proper destination, and lastly the liability of greater soreness and discomfort following the operation, than would be the case if delayed till another sitting. There are many cases in which these objections do not exist, or may be easily overcome, and many others in which they *may* be overcome or endured if it is desirable or necessary, and there can be no universal rule of good practice laid down, but every operator will form his own habits in the matter, in accordance with his preferences, or the special requirements of his particular practice. It is likely that country practitioners will complete these operations at once in a much larger proportion of cases than those in cities, whose patients are more accessible, and in the habit of being more fully subject to the requirements of their dentist in the matter of numerous sittings.

The third class of cases, those having putrescent pulps, should have a broader definition, if intended to cover the cases all the way between, but not including, those devitalized and filled without sepsis, and those in which an abscess has been formed. The first of the subheads in this class is suppurating pulps; the second, putrescent pulps; and a third, those in which the decomposition and removal of the pulp is complete, but without the formation of an abscess. Each of these three subdivisions implies that the pulp chamber or root canal is open or has been open. The most significant and important thing about all these cases is sepsis or infection, and there are two decisive objections against immediate root filling, unless for some reason the necessity for it is so urgent as to justify the taking of considerable risk. The first objection is in the fact that disinfection, to be thorough and trustworthy, requires time for its accomplishment. The second objection is the impossibility of knowing certainly, whether the apical space has become infected, or whether it is infected during the operation, which is liable to happen, notwithstanding all possible care, if the work is completed at the first sitting. A very large proportion of these cases will do well if immediately filled, and some of them are so near like the preceding ones as really to belong with them. For instance, if a suppurating or putrescent pulp shows some life, and its removal is followed by somewhat free hæmorrhage, the portion next the apex appearing to be in a nearly normal condition, there would be little fear of trouble if immediately filled. If, however, the whole root canal appears to be in a septic condition, it cannot be cleaned and filled at once without an unjustifiable risk of subsequent trouble that could probably be avoided by taking more time.

The first point to be gained in these cases is the disinfection of the root canals. This is more quickly and surely accomplished after the removal of so much of their contents as can be got away without danger of forcing anything through the foramina. Then some strong and diffusible antiseptic should be placed in them for some days. (Free diffusibility is more important than great strength of concentration.)

This application may usually be tightly closed in by a gutta-percha stopping, though a vent will sometimes prove necessary. At the second sitting the canals may usually be safely cleaned out to the foramina, though I have seen cases in which oil of cassia and myrtol had been tightly enclosed for a week, without developing the least trouble, which yet became acutely inflamed, and in some instances formed abscesses, after thorough cleaning and treatment at the second sitting, showing (probably), that the disinfection of the apical portions of the root canals had not been so complete as was expected. (There may be some cases in which acute peridental inflammation is caused by the antiseptic instead of by infection, but if that is the cause, it will not develop into an abscess.)

The third sub-class above mentioned, (in which the decomposition and removal of the pulp are complete,) are not always certainly distinguishable from those having blind abscesses, and the same general line of treatment usually proves appropriate in either case, though if there is active formation of pus, or if it becomes active under the stimulation of treatment, a tight closing in of the medicines is, of course, impracticable at first. That anybody should seriously advocate the immediate filling of roots that will not bear a tight temporary stopping for half a day without severe pain and inflammation, which is promptly relieved by removal of the stopping, seems incomprehensible. Perhaps no one does advocate it in just these cases, but some certainly do in cases that are impossible to distinguish from these at the first sitting. If there is a dead pulp, with the peridental membrane and the tissues at the apical space in a normal condition, we have only to remove the corpse and disinfect the chamber and canals, but if the apical tissues are diseased, we need in addition to have them cured before we fill the roots, or so far in the way to recovery that the remainder of the process can be depended upon to complete itself. This would seem to be so reasonable a proposition as to need no argument, but it has been urged by some that the foramen of a root is usually so small as not to permit the drainage of a blind abscess through it, or the diffusion of medicines through it to the diseased apical tissues. This is undoubtedly the case in a few instances, but clinical observation is conclusive to the contrary in a very large proportion of cases.

The Dental Review.

SOME SUGGESTIONS AS TO THE RELATION OF THE TEETH TO EMPYEMA OF THE MAXILLARY SINUS.

By Dr. M. H. Fletcher.

The writer's views coincide with those of Zuckerkandl, Schiffert, and the others who believe these antral troubles are more largely caused by intranasal disorders.

This opinion has been arrived at after some years of experience, in addition to the examination of *one hundred skulls*. These skulls were examined with special reference to the relation of diseases of the teeth to the antrum. It is known that the anatomy of the antra of the superior maxillary bones and their nervous supply is such that there can be no disease by reflex action from one to the other as occurs in sympathetic ophthalmia, consequently these cavities are dealt with as separate organs. The statistics then would show two hundred antra instead of one hundred. These skulls were examined for five particular points, viz., First, for abscessed teeth; second, for septa ; third, for conical protrusion of the roots of the teeth into the antrum ; fourth, for perforation by the roots of the teeth without protrusion ; fifth, for perforation of the antrum from ulcerated teeth.

First. As to abscessed teeth and the connection of such abscesses with the antrum. Only such teeth are mentioned as might most easily produce antral troubles, viz., the three upper molars , the bicuspids and cuspids being too far forward to be counted in these statistics. I might say, however, that in a number of these skulls evidence of ulceration was found in the bicuspids and cuspid, with no apparent connection whatever with the antra, save in one case. As to the molars, ulceration was found in more than twenty-five per cent. of the skulls, there being in these two hundred examinations, fifty-seven ulcerated teeth, and out of these *fifty-seven possible* cases of perforation by inflammation and its results, we found such to be the case *only four times*, all other cases having perforated the alveolar border and discharged the pus into the mouth, two of them discharging both in the mouth and in the antrum. This does not show a very large proportion of cases where antral trouble has come from the teeth, being less than eight per cent. in fifty-seven possible cases.

In addition to these figures I wish to offer as negative evidence statistics from my own records in regard to the relation of these diseases of the teeth to the antrum, as they have come under my daily observation. I have in the past ten years treated 916 cases of pulpless teeth, 224 of these being superior molars, which, according to some authors could and probably would have caused inflammation or pus in the antrum of Highmore. Out of this number from my own records only one had pus in the antrum as far as I could tell; and this is the only marked and certain case of empyema of the maxillary sinus caused by the teeth that I have seen. I have, on the other hand, treated a case in which the teeth were made pulpless, and some of them lost in consequence of disease of the antrum; and this I believe to be a condition more frequently brought about than the reverse, from the fact that some of the teeth (in the skulls examined) perforated the floor of the antrum with no protuberance, septa, or other covering save that of the mucous membrane. Such perforation I have found in eight cases, which number I believe to be smaller than it should be could all cases have been thoroughly examined for minute openings. It must be evident that the mucous membrane covering the apices of such teeth, if diseased, could easily cause the death of a tooth by destruction of its blood and nerve supply, which, in its turn, would produce a dental abscess or inflammation about the roots of the teeth, thus producing a difficult case to diagnose. The probabilities are that such diseased teeth having been found connected with the antrum the teeth have *improperly* borne the blame. In order that these cases can be properly diagnosed, they must needs be examined by one thoroughly familiar with alveolar abscesses and the causes leading thereto, which very few persons can do who are not experienced dental practitioners of acute and accurate observation.

It would seem that these teeth whose roots *perforate the antrum*, where there is usually *neither septa or protuberance* over the roots of the teeth, are more likely to cause the trouble in question than those which show the tubercle above the roots. This protuberance in question seems to be the prevailing idea of the relation of the teeth to the floor of the antrum, but this from my own observation is quite erroneous, never having seen but one case which approaches this condition.

Some further observations made in regard to the floor of the antrum are as follows: In about twenty-five per cent. of the cases examined small septa or ridges were found to cross the antrum. These ridges have no relation to the position of the roots of the teeth, although in some cases they were found to come directly over the roots in place of the tubercle. Evidence can be presented to show that abscessed teeth probably do not often break into the antrum nor cause frequent trouble there, by taking into consideration the amount of cancellous tissues found about and above the roots of the molars in almost every case. By examination it will be observed that the diploe or cancellous bone about the roots of the teeth affords quite ample space for the products of considerable inflammation. These spaces being filled with soft tissues, like marrow, easily take on inflammation, and the products of inflammation may largely displace them. Again, when we have inflammation in this cancellous tissue and about the apex of the root, we have the peridental membrane largely involved. This of itself gives way, as is evidenced by the lengthening of the tooth, and the products of inflammation may easily push down the side of a root and also easily perforate the alveolar process. The alveolar process on the buccal surface over the roots of the teeth being very thin, of course would be quickly perforated, and in many cases the upper parts of the roots are simply covered with soft tissues and no bone; whereas the floor of the antrum is usually thicker and of a dense, horny character, and is also held more firmly in position by the cancellous bone growing from its under side, consequently it would not be perforated as quickly as the alveolar process. It also seems in these cases that the peridental membrane is very largely affected, which is evidenced by an examination of the sockets and bone where there has been an alveolar abscess. One of my specimens shows the evidence of a perforation in three separate places, —one for each separate root of the superior molar, the two buccal roots having discharged the products of their inflammation in the mouth and the palatal root opening into the antrum at the apex of the tubercle. This antrum also has a more distinct septum than most that were examined, although I found four or five septa that were even larger than this.

I found one case which had evidence of the worst trouble I found from alveolar abscess. In this case the roots of the cuspid, first and second bicuspids, and palatal roots of the first molar were involved. A cavity had formed reaching from the lateral back to the first molar, and from the alveolar border to the summit of the canine fossa, measuring about an inch in diameter. A septum seemed to have formed, or had already been formed, between this cavity and the antrum, completely isolating the antrum from any connection with the trouble, although the palatal root of the first molar was involved ; yet there seemed to have been no connection of the disease between this tooth and the antrum, although the floor of the antrum could easily have been perforated through the socket of the buccal roots. If there was a discharge from this molar at all it showed no evidence in the antrum, but did show evidence in this external and anterior cavity which seemed to have been the result of chronic inflammation and collection of pus.

In regard to the proper place to perforate the antrum, when demanded, after taking the anatomy of the parts into consideration, it would seem that for several reasons the opening should be made between the apices of the second bicuspid and first molar. Firstly, because this locality is the most accessible. Secondly, a perforation here does not interfere with the blood or nerve supply of either tooth. Thirdly, by raising the lip well and slanting the drill upward and backward, one is sure to strike the floor of the cavity almost at its lowest point. Fourthly, if a tube must be inserted in this position, it will be held somewhat in place by the lip whether the teeth are present or absent.

The summing up, then, of the evidence seems to be :

First. That the anatomical relations between the teeth and the antrum are not generally understood, since the sections shown give evidence of much more cancellous bone than is usually considered to exist.

Second. Small septa are present in a large per cent. of cases, and these septa or ridges have no direct relation to the position of the teeth.

Third. Statistics seems to show that a very small per cent. of abscessed teeth have any connection whatever with the antrum, this per cent. probably not being over seven to ten.

Fourth. The evidence seems to indicate that the protrusion of the teeth into the cavity is very largely the exception instead of the rule, and that if they do protrude this is not evidence that an alveolar abscess would break there, since these tubercles are usually formed of dense, hard bone.

Fifth. A number of cases have been found where there is a perforation of the bone by the apices of the teeth and no protrusion, but that these apices are simply covered with mucous membrane ; thereby the teeth may be affected by inflammation of the antrum, causing their death and loss or a continuence of the trouble in the antrum when such teeth remain untreated, in consequence of this special feature of the anatomy, and that pulpless and inflamed teeth are thought to be the cause of antral trouble where the reverse is oftener probably the case.

Sixth. That seemingly the best place to perforate the antrum of Highmore for pus is between the apices of the second bicuspid and first molar.

The Dental Journal.

THE CRACKING OF TEETH IN SOLDERING.

By L. P. Haskell, D.D.S., Chicago.

Perhaps a few suggestions may not be amiss. If dentists would consider that "cross" pin teeth are more apt to crack than the perpendicular or "straight" pin teeth, they would use fewer of them. They are not only more liable to crack in soldering, but are not as strong for wear.

Do not rivet your pins, as the solder flows only upon the head of the pin; split the pin and if the hole is larger than the pin, so much the better, for the solder flows down inside and holds the stronger.

Never heat up the case until the borax and solder have been applied. Heat up over the large burner, slowly at first and then turning on the full head; take about one half-hour. The heat should (in case of a plate) be thrown by the blowpipe upon the plate first, so that it may be as hot as the backings, as they will heat up as a matter of course from their exposed position. Then throw the heat directly upon the solder. If necessary to apply more solder do so, but not more borax, as there is danger of thus cracking the teeth.

Many dentists experience much difficulty in soldering by using the miserable little jewellers' blowpipes, which are not at all suitable for dentists' use, there not being a sufficient volume of flame, and the mouth aperture being so small that it has to be taken inside the lips, thereby causing the muscles to become tired.

Another difficulty is found in not having a suitable soldering burner.

The Dental Review.

THE DENTAL MANIFESTATIONS OF GOUT AND LITHIUM BITARTRATE.

By Edward C. Kirk, M.D.

The coexistence of the gouty diathesis with certain forms of suppurative gingivitis, known to dentists as pyorrhœa alveolaris, Rigg's disease, &c., has long been observed both by medical men and dentists. Sir A. Garrod and Sir Dyce Duckworth have each called attention to the dental evidences of gout, the latter describing what he terms the "buck tooth" of gout as characteristic of that disorder. This same buck tooth which Sir Dyce Duckworth describes, it is interesting to note, is invariably found to be produced by a localised pyorrhœa alveolaris, the faulty alignment and subsequent extrusion of the tooth from its alveolus being the result of that disorder. Recently, new light has been thrown upon the causal relationship of the gouty diathesis to the local dental trouble, by the investigations of Dr. C. N. Peirce of Philadelphia, published in a recent issue of the *International Dental Journal* and the *Dental Cosmos*. He has shown, through clinical analyses made at his request by Professor Congdon of the Drexel Institute, Philadelphia, that calcareous deposits taken from the roots of teeth lost from pyorrhœa alveolaris contain, besides the usual calcium carbonate and phosphate, a considerable quantity of uric acid and calcium and sodium urates. From this he draws two important and seemingly justifiable conclusions: firstly, that these deposits upon the tooth root and its ligamentous pericementum are not salivary but hæmic in their origin, for he has further shown the existence of these deposits in cases where there was no solution of continuity of the attachment of the gum tissues at the cervical portion of the tooth, hence there was no possible opportunity for the saliva to gain access; and secondly, the presence of uric acid and urates so derived and deposited upon the tooth root and in the ligamentous structures surrounding it, taken in connexion with the subsequent clinical history of pyorrhœa alveolaris, especially in view of the gouty relationship so frequently previously observed, warrants us in considering the disease in question as but one more of the many local expressions of the protean constitutional disorder known as gout or lithæmia. As further evidence of the correctness of this view, nearly all of the cases which after thorough local treatment have been subjected to intelligent constitutional treatment directed towards the elimination of uric acid and its compounds have progressed rapidly towards a cure, all local gingivitis disappearing, with no tendency to return. The exhibition of lithium in some of its combinations in connexion with a proper dietary regimen has proved most beneficial in these cases. In a number of pyorrhœa cases I have found a marked acidity of the secretion from the mucous glands of the lip. The pouring out of this secretion brings about localised areas of decalcification of the enamel, and later of the dentine, producing the condition of the teeth known to dentists as erosion.

In seeking for some constitutional remedy for this abnormal condition of the labial mucus the administration of potassium bitartrate or common cream of tartar suggested itself from its well-known ability to produce an alkaline reaction of the secretions, particularly of the urine, when given in small repeated doses. The idea then presented itself to enhance the solvent power for uric acid of the alkalinity so produced, by combining a definite amount of lithium with the tartrate, in order to express, so to speak, its solvency in terms of lithium instead of potassium. This was done by exactly neutralizing the acidity of the potassium bitartrate with lithium carbonate. This resulted in the production of neutral potassium-lithium tartrate, the chemical analogue of Rochelle salt. Further, in order to eliminate the potassium element altogether, so as to obtain the highest solvent efficiency of the lithium, a lithium bitartrate was made, the salt when produced presenting all of the physical properties of potassium bitartrate of which it is the chemical analogue. In fact the lithium bitartrate was indistinguishable in appearance from ordinary potassium cream of tartar, it might therefore be described as a lithium cream of tartar. The two salts described have been given a limited therapeutic test in gouty cases, those selected being of the irregular or suppressed type of the disorder. The lithium Rochelle salt (lithium potassium tartrate), being a neutral salt, is devoid of any irritating property to the gastro-intestinal mucous membrane—a feature that is desirable in cases of gastric or intestinal gouty irritability. My testing of the preparation has been confined solely to the class of cases alluded to, and these have not included any presenting classic symptoms of true gout with articular inflammations, tophi, &c. A question may arise as to why there should be any superiority of lithium bitartrate over the citrate. As to this, I do not know, more than that I have used both the citrate and carbonate freely, and the bitartrate has given me results beyond all comparison superior to any preparation of lithium which I have tried. My satisfaction in the use of the preparation described has impelled me to call attention to its value, in the hope that the well-known prevalence of gouty affections in England may afford a field for a wider and more complete study of the therapeutic possibilities of this drug and at the same time acquaint others with what so far appears to be its strongly marked value in the treatment of disorders dependent upon the uric acid condition. The relative efficacy of the two preparations is however, greatly in favour of the lithium acid tartrate. It is markedly diuretic and in some cases laxative in its action. The latter is especially the case when the drug is taken before breakfast. The promptness of its action is in many cases astonishing, a subsidence of distressing symptoms quickly following the administration of three doses of five grains each, taken four hours apart in a half-pint of water on a reasonably empty stomach. The use of the preparation in the quantities named has sufficed in all cases so far treated, about twenty in number, to practically cure the disorder, temporarily at least.

The Lancet.

THE TREATMENT OF PERICEMENTITIS.

By C. N. Johnson, L.D.S., D.D.S.

Probably one of the most painful affections with which the dentist has to deal is that of acute pericementitis immediately preceding alveolar abscess. This is easily accounted for when we consider the anatomical relations of the tissues surrounding the root of a tooth. The pericementum is encased in a bony socket with unyielding walls on either side, and a slight degree of inflammation results in an undue amount of pressure. No matter from what cause pericementitis may be induced there sometimes comes a stage when no kind of treatment directed into the pulp chamber and through the canals is in the least effective. It is to the consideration of this phase of the affection that I wish briefly to call attention.

In those cases where the canals have been opened up and a free vent made for the escape of gases, and this has failed to bring relief, it is an indication that the tissues of the peridental membrane have become so far implicated that the inflammatory process will go on independent of further irritation. This has always proved in my hands the most difficult stage of the affection to control, till within the past two or three years. During that time I have followed a practice which if faithfully carried out has seldom or never failed to give satisfactory results. The treatment consists in the application of moist heat to the gums surrounding the affected tooth.

The method of procedure is as follows: Water as hot as the tissues will tolerate is taken up in a large bulb syringe having a fine point. A jet of hot water is directed upon the gums and into the cavity of the tooth, all cotton or other dressings having previously been removed from the canals. The tooth and surrounding tissues are thus submerged in water as hot as the patient can tolerate. During the refilling of the syringe the water is to be retained in the mouth and then emptied into the spittoon just previous to another application. The water should be kept on a gas stove near at hand and the heat gradually raised as the tissues will admit. It will be found that in the end water extremely hot may be used if the heat be gradually increased, and one of the essentials to success in this treatment is to employ an exceedingly high degree of heat. If the tongue and other tissues of the mouth remote from the region of the tooth are too much affected by the water, a saliva ejector may be used to carry off the water after it has flown over the gum in the immediate vicinity of the inflammation. The gum in this region will often tolerate a much higher temperature than the normal tissues. In fact an application so hot as to be extremely painful to normal tissue often proves instantly soothing to the affected parts. The process should be kept up until perfect relief has been obtained, and the length of time necessary for this varies in different cases. In some instances where the pain is most distressing prior to the application the sense of relief will appear so suddenly as to prove astonishing, while in others it will require persistent treatment for perhaps thirty or even forty minutes before a substantial effect is produced. I have never yet encountered a case where persistent effort failed to finally bring a cessation of pain. As to the permanency of the relief, this is governed largely by conditions and circumstances.

If the general tone of the system is bad; if there is universal congestion strongly marked by the symptoms of what is commonly called "a heavy cold;" if the circulatory and absorbent systems are bodily out of condition; or if the excretory organs fail to perform their function, then the relief is necessarily temporary, and we must resort to constitutional treatment in order to gain permanent results. A patient in this condition should be given a rapidly acting cathartic, the citrate of magnesia in large doses having proved in my experience the most pleasant and satisfactory. Again, if the inflammation has gone on to a point where suppuration has begun in the apical space, we cannot hope for complete relief till the abscess has pointed and discharged, but even in these cases we may be reasonably sure of preventing extensive infiltration and puffing of the superficial tissues, and also of mitigating the suffering.

As to the circumstances which may render the relief temporary, I have noted that if the patient left immediately after the hot water application, and went into the open air on a cold day without carefully protecting the whole side of the face from the air, the pain would ordinarily recur. In other words, exposure would bring back the trouble. But not the least among the gratifying results that have followed this line of practice in my hands is the large per cent. of cases where a permanent relief has been gained.

A criticism might be made by some as to advisability of leaving the cavity and canals open during the treatment. The argument might be used that there was danger of additional infection through the medium of the open canals, but I have never seen a case where I could trace any evil effects to this cause. My reasons for leaving the canals open are, that I wish the hot water to reach the apical space if possible, and that there may be a likelihood of the water in flooding the cavity and canals, floating to the surface or dislodging small particles of debris that may have been packed in the canals near the apical foramen, and which the broach has failed to bring away. I never leave the cavity open when I dismiss the patient. If the tooth is not too sensitive to pressure I usually dry the canals as thoroughly as possible after the pain is relieved, and then flood them with an antiseptic. A small pledget of cotton saturated with the antiseptic is then placed loosely in the chamber, and the cavity sealed with Gilbert's temporary stopping. The canals themselves are never packed with cotton at this sitting, and if the tooth is much raised in its socket and extremely sensitive to pressure, I do not even attempt to seal with gutta percha. A tooth in this condition should be worked upon with instruments as little as possible. The mechanical irritation invariably results in increased sensitiveness. Where the tooth is loosened and sore from swelling of the pericementum, I simply dry the canals, flood them with an antiseptic, and place some cotton in the cavity merely to keep food and debris from packing into the tooth. I should much prefer dismissing the patient in this condition and taking chances of infection through the imperfectly sealed cavity to attempting a thorough sealing at this sitting. These are mostly emergency sittings and our principal office is to relieve the present distress. Usually in twenty-four hours the tooth will be in a condition to work upon, and it may then be treated and sealed.

The simplicity of the hot water treatment would seem to argue that the case could as well be treated by the patient in his own home as by the dentist, but my experience has taught me that the results are seldom satisfactory. Somehow patients do not succeed, no matter how careful the instructions. They do not use the water hot enough, or they do not apply it properly, or do not keep up the application a sufficient length of time. In fact, the element of time in this treatment proves one of the greatest obstacles to its practical application. As has been stated these are emergency cases, and are likely to call for attention at any hour through the day without previous appointment. In a full practice where almost every moment of every hour is systematically assigned in advance for the regular routine work of the office, it is exceedingly trying to the operator to be called away from his work to devote any considerable time to an unexpected patient. In those cases where I have fallen short of producing the most satisfactory results it has been traceable to this dilemma. And yet a dentist's first duty as a practitioner and as an individual is to relieve suffering no matter when or how it appears.

In searching for a theory to account for the results obtained by the application of hot water I was led to consult Dr. W. T. Belfield in the matter. I then learned for the first time that he had long been a strong advocate of hot applications for the relief of pain in other tissues. His theory was that heat, especially moist heat, was an anæsthetic. This would account for the relief of pain temporarily, but if this were the only action of hot water the pain would recur in a short period. To account for the permanent results which I claimed to have undoubtedly secured in many cases, he said that hot water applied in the manner I had indicated would prove a very rapid and effectual absorbent. It is to this latter quality that I attribute the lasting results, and this argues especially for a somewhat protracted application. Dr. Belfield also stated that in the use of hot water, a very minute stream should be used to play upon the tissues. A jet such as would come from a hypodermic needle he had found more effective than a larger stream. In conclusion I may add that in some cases where the pain has been excruciating, I have added to the hot water a few drops of carbolic acid, making about a five per cent. solution. The anæsthetic effect of carbolic acid is thus added to that of the hot water, and the relief is usually exceedingly prompt and very gratifying to the patient.

The Dental Review.

THE SURGICAL ENGINE AND ITS USES.

By Dr. M. H. Cryer, Philadelphia.

The manifold uses of the surgical engine may be best understood by the citation of a few typical operations in which it is successfully employed. For example, removal of sequestra, caries, osteomata, and for cutting into and through bone for the resection of nerves.

1. *Removal of Sequestra.*—A case of sequestrum which came under my notice was that of a surgeon, wounded through our civil war in the lower third of the left thigh, the ball splintering the femur and causing subsequent abscesses and fistulæ. At different times the bone had been cut down upon, and the parts chiselled and scraped without effecting a cure. About five years ago the patient came to the Hospital of Oral Surgery for treatment. It was decided to open the parts, which being done, the bone was found to be diseased to

the extent of six or seven inches. There were also several cloaca through which a sequestrum could be felt incased within the shaft of the bone. By means of the surgical engine a bur and circular saw being used, a longitudinal section of bone was cut out exposing the sequestrum. Upon its removal the rough edges and remaining dead bone were burred away. The parts healed remarkably well, and have since given no trouble. Similar results in caries of like nature are numerous, the percentage of recoveries being greater than when performed after the ordinary manner, by reason of lessoned shock and local disturbance.

2. *Removal of Caries.*—Case after case of permanent success attained in this department of bone surgery might be quoted, especially when diseased parts of delicate and thin bone are to be operated upon, or where the pathological tissue is closely associated with vital parts and healthy portions are worthy of being saved, as for example with bones of the face, cranium, vertebræ, and ribs. The resection of a carious superior maxilla can be seldom accomplished after the old way using bone forceps, chisel and gauge, without injuring healthy and adjoining parts. By the use of the engine a diseased portion can be harmlessly cut away. In extreme caries of the inferior maxilla a rim of healthy bone with overhanging edges of periosteum can be and is often saved.

3. *Removal of Osteomata.*—A young lady about eighteen years of age had an enormous growth covering the anterior surface of the right superior maxilla. This enlargement, consisting of an ivory-like exostosis, was removed by Prof. Garretson and myself. No external cut was made. The lip was raised, and the cheek dissected from the osteoma. By using different-shaped long-shanked burs, the hard tumour was cut away. During the operation the instruments were often withdrawn and the cheek allowed to fall into place, thus making sure that the proper contour was being obtained. Had the hammer and chisel been used, the face would necessarily have been opened, thus making an additional risk and leaving a very deforming cicatrix.

IV. *Cutting for the Resection of Nerves.* The proper amputation of the nerve at the oral foramen is one which involves no little difficulty at times, by reason of the hæmorrhage and the limitations imposed by the surrounding tissue, which interfere with direct vision. The bony structures offer an unyielding resistance to the use of any of the special instruments which have heretofore been used for the purpose.

To obviate the difficulties which I have noted and to furnish a means for the amputation of the nerve with certainty and precision at the exact point desired (in the case under consideration the foramen ovale), I have devised an instrument which I call a neurotome. It is constructed of steel, and consists of an outer tube with a fenestrated end, the free extremity of which is rounded or tapered, and having on its inside surface, near the end, a projecting shoulder which is continuous around the inner periphery of the outer or canular tube. The inner cutting portion of the instrument consists of a steel spindle which fits closely and smoothly within the outer tube, and has its free end fashioned into a tubular knife similar to a cork borer or leather punch. In use, after the nerve has been dissected out from its canal, its end is passed through the distal opening of the neurotome and out through the fenestrum in its side. The instrument is gradually pushed along the nerve, and worked in the direction of its foramen of exit. When it has been ascertained that the end of the neurotome has been brought into close contact with the bone at the foramen, and the nerve is made tense by traction, the centre cutting-punch of the neurotome is driven home with a rotary motion against the shoulder mentioned before at the end of the outer canular tube, which will cleanly sever the nerve at the point desired, with no risk of injuring the deeper structures or the adjacent blood-vessels.

The operation has been done many times with entire success. The most interesting example was one in which eight distinct and separate operations by some of the most skilful surgeons had been performed for the relief of neuralgia in the region of the lower jaw. Two attempts at cure were made preceding the one I suggested. On October 8, 1892, the lower lip was opened through the median line to the lower border of the mental process, and an incision made along the body of the bone to the insertion of the masseter muscle. The lip and cheek were then dissected from the bone, and the inferior dental canal opened by suitable burs driven by the engine. The nerve was taken out of the canal and the soft parts readjusted. On returning to consciousness, the patient felt no relief whatever. The rest of the pain seemed to be localised upon the body of the bone, especially on the inner side. On the following Saturday, October 15, it was thought best to open the parts, and by the use of the engine-bur the greater portion of the body of the bone on the left side was removed, but no relief was obtained. Time was given for the parts to heal, and for the patient to recover from the shock, in the hope that the pain might pass away, but it became more and more aggravated. The patient's suffering was so great that he would throw himself on the floor and cry for relief. Finally Prof. Garretson decided to perform the operation that I had suggested. After deepening the sigmoid notch by the use of a barrel-shaped engine-bur, the nerve was fully exposed to view. The patient was well under the influence of ether, and did not respond to the cutting of the bone or other tissue, but as soon as the nerve was seized by the hæmostatic forceps, he exhibited by his movements and outcries, the agony of the pain. The nerve was drawn out of the canal and cut off as high and near to the oval foramen as possible. Upon the section of the nerve which was removed, there were two large and distinct neuromata, the lower one being impinged upon by the triangular process of bone at the opening of the inferior dental canal, the upper one was under the external pterygoid muscle. Beyond a doubt here was the cause of the neuralgia. Several arteries were ligated before the parts were closed. The patient came from under the influence of the ether without the slightest pain, and has not had a twinge of any kind whatever up to this time. It is now over nine months since the operation was performed.

These cases are given as typical illustrations of the very many in which the engine has been successfully employed in my personal experience, commencing about 1876, with the ordinary dental engine, and with the Bonwill surgical engine in 1881. In addition to these cases there might be named resection of the elbow-joint, resection of a portion of the ramus at near the angle of the inferior maxilla, in order to make a false joint to relieve a true ankylosis of the temporo-maxillary articulation. The removal of a diseased portion of the calvarium measuring three by four inches without inflicting any injury to the membrane of the brain, osteoma from the floor of the orbit, osteoma from the inferior surface of the body of the sphenoid bone. This tumour plugged up the posterior nares and filled the greater portion of the naso-pharyngeal space. Caries of the mastoid process of the temporal bone. For the relief of coxalgia by removal of the coccyx, through an external opening, without disturbing the perineum.

The Dental Cosmos.

Animals instinctively choose such food as is best suited to them, and to a certain extent the human race also shows this instinct, and medical men are sometimes at fault in not paying sufficient respect to the likes and dislikes of their patients. Women, as a rule, are more often hungry than men, and they do not like the same kinds of food; nevertheless, men and women are generally put on precisely the same regimen, especially in public institutions. Infants scarcely weaned are given a diet suitable to adults, which they dislike, and which disagrees with them. Some years ago Delaunay investigated this question in the different asylums of Paris, and ascertained that children, although they will generally eat it, do not like meat before they are about five years of age. People who like salt, vinegar, etc., may generally be allowed to satisfy their tastes with moderation. Lorain always taught that, with regard to food, people's likings are the best guide.

Science Siftings.

Dental News.

PASS LIST.

The following gentlemen, having passed the necessary examinations, were admitted Licentiates in Dental Surgery:

Allworth, Alfred Leigh, M.R.C.S. Eng., Guy's Hospital and National Dental Hospital.

Barrett, Charles, Charing Cross and National Dental Hospitals.

Britten, Arthur, Mason's College and Dental Hospital, Birmingham.

Constant, Frederick Charles, Guy's Hospital.

Davison, Thomas Stockil, Guy's Hospital.

Dodson, Arthur Rankin, Charing-cross and Dental Hospitals.

Farmer, Francis Mark, Middlesex and National Dental Hospitals.

Flintan, Francis Robert, Charing Cross and Dental Hospitals.

Halliday, Harold David, Middlesex and Dental Hospitals.

Harding, Henry Paxton, Royal Infirmary and Dental Hospital, Liverpool

Henry, Percy Francklin, Guy's Hospital.

Holden, Allen, Owens College and Victoria Dental Hospital, Manchester.

Hills, William Ernest, Guy's Hospital.

Huckle, Arthur Henry Headley, Guy's Hospital.

Humphreys, Harold Francis, Guy's and Dental Hospitals.

Jones, George Wilcox, Guy's Hospital.

Lees, James Adam, Owens College and Victoria Dental Hospital, Manchester.

McFarlane, John Scott, Charing Cross and National Dental Hospitals.

Mackley, Ernest Hubert Alborough, Middlesex and Dental Hospitals.

Miller, Quintin Herbert, Charing Cross and Dental Hospitals.

Moore, George Peirce, M.B. Dub., Trinity College and Dental Hospital, Dublin, and National Dental Hospital.

Musgrave, Gilbert Mordaunt, Guy's Hospital.

Nicholls, Reginald Edward, Charing Cross and National Dental Hospitals.

Nichol, James Main, M.R.C.S. Eng., Yorkshire College, Leeds, and Dental Hospital.

Pare, John William, M.D. Ed., Edinburgh University and Guy's Hospital.

Park, William Hodgson, Charing Cross and Dental Hospitals.

Peake, George Arthur, M.R.C.S. Eng., Royal Infirmary, Dental Department, Bristol.

Pilcher, William Henry, Guy's Hospital.

Prideaux, Henry Symes, Charing Cross and Dental Hospitals.

Reeve, Harry George Cleave, Middlesex and Dental Hospitals.

Rispin, William, Charing Cross and Dental Hospitals.

Robinson, George Edward James Antoine, the University and Dental Hospital, Dublin.

Sibson, Arthur Bertram, Owens College and Victoria Dental Hospital, Manchester.

Snape, Joseph, University College and Dental Hospital, Liverpool.

Soper, Frank Arthur, Middlesex and Dental Hospitals.

Taylor, Edwin Henry Pascal, Middlesex and Dental Hospitals.

Thornton, Robert, Guy's Hospital.

Trewby, Henry William, Middlesex and Dental Hospitals.

Tyrrell, Albert John, Guy's Hospital.

Van der Pant, Horace William, Charing Cross and Dental Hospitals.

Willis, George Nicholls, Guy's Hospital.

Yonng, Ernest Edward, Charing Cross and Dental Hospitals.

Twenty-four candidates were referred back to their professional studies.

DENTAL HONOURS.

Dr. George Cunningham, of Cambridge, has been elected Corresponding Member of the Sweden Dental Society, and of the *Societe d' Odontologie de Paris* in recognition of the services he has rendered to the Dental Profession.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the British Journal of Dental Science.

Sir,—In continuation of my inquiries in your last issue of the Journal as to names appearing on Dentist's Register, can you inform me why persons should be allowed to carry on a practice under the name of a man who has been deceased over five years, or under the name of a man who is not a dentist, thereby enabling one to practise who is not registered? These things certainly want ventilating?

ENQUIRER.

[*** The only reason why such practices are so carried on is because no one takes the necessary steps to stop them. With regard to our correspondent's former letter, he should read reply to L.L,—Ed.]

L. L.—You do not give your authority for the statement that the Dentists' Register is re-opened for the registration of *bona fide* dentists. In default of any recognised authority we refuse to believe that such is the case. The General Medical Council suspended the admissions under Clause 37 some two years ago, considering that a sufficiently long time had elapsed to allow all those entitled to register to do so.

Dental Hospital Reports.

Work done at the Victoria Dental Hospital of Manchester during the month of June, 1894.

Number of Patients attended	1104
Number of Extractions	479
Number of Extractions under Anæsthetics	153
Gold Stoppings	63
Other Stoppings	264
Miscellaneous (advice, temporary fillings, scalings, dressings, &c.)	527
Crowns	4
Total	1594

Herbert G. Ashby, *House Dental Surgeon.*

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
6. The Journal will be supplied direct from the office on PREPAYMENT of subscription as under:

Twelve Months (post free) - - 14s. 0d.

Post-office Orders to be made payable at the Langham Place Hotel Office to G. E. Skliros, 289 & 291, Regent Street, W. A single number sent on receipt of seven (penny) stamps.

British Journal of Dental Science.

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GENERAL PATHOLOGY AND SURGERY FOR DENTISTS.

By EDMUND W. ROUGHTON, M.D., B.S. (Lond.), F.R.C.S. (Eng.)

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EVERY practitioner of the healing art, no matter what his particular branch may be, cannot do his work with satisfaction to himself, and advantage to his patients, unless he possesses an adequate knowledge of the structure and working of the complicated human machine with which he has to deal, both in health and in disease.

Anatomy and Physiology deal with the structure and functions of the body in health, and Pathology with the same in disease. To the student of Dentistry it is not necessary to be acquainted with the whole of these extensive subjects. In the following pages an endeavour will be made to set forth, in as clear and concise a manner as possible, just so much Surgery and Surgical Pathology as the student in Dentistry will find necessary for his examinations, and for the intelligent and efficient practice of his profession.

INFLAMMATION.

This important process underlies nearly the whole of Pathology, and must be thoroughly understood at the outset.

If an irritant be applied to a living tissue, a series of changes (collectively called inflammation) will ensue. These changes can be best studied in a transparent tissue such as the mesentery of the frog. Suppose then that this tissue be spread out under the microscope, and be punctured with a hot needle. The first effect noticed is a momentary contraction of the vessels in the neighbourhood of the injury. This is soon followed by *dilatation*, and an increased flow of blood to the part. Very soon the flow of blood gets slower and the white corpuscles (leucocytes) collect in quantities at the sides of the vessel and adhere to its wall, whilst the red corpuscles still pass on. Before long the stream becomes very slow indeed, the corpuscles passing onwards during systole, and back

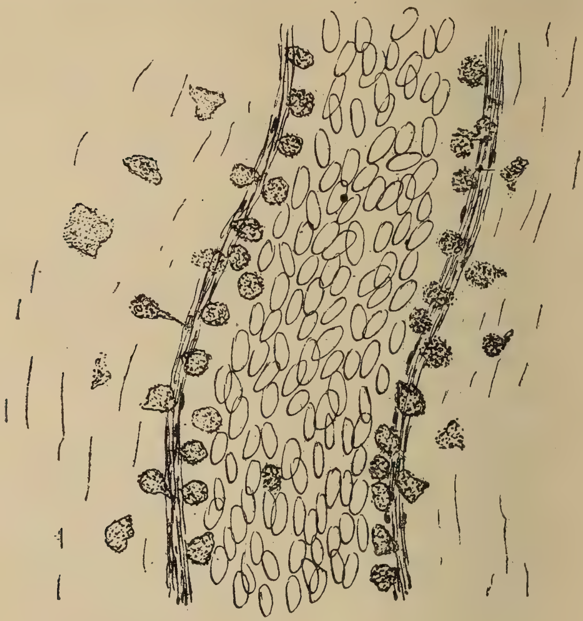

FIG. I.

Small vessel from the inflamed mesentery of a frog, showing migration of leucocytes.

again during diastole. This is called *oscillation*, and is soon followed by *stasis* or complete stoppage. Whilst these changes are occurring, the liquor sanguinis oozes out into the tissues through the vessel wall, and the white corpuscles also escape by a process called *migration* or *diapedesis*; they work their way through the thin vessel wall by their own amœboid movement, leaving no aperture whence they came out. (See Fig. 1.) When the inflammation is very intense a few red corpuscles escape too, but they are simply forced out by the increased pressure inside the vessel, not by any active movement on their own part, indeed their presence in the exudation is accidental.

The Exudation. In health, the fluid which filters through the vessel walls contains no fibrin-forming substances and is not coagulable. In inflammation, the damaged vessel walls allow the plasma to pass out almost unaltered. With the aid of the leucocytes which contain the fibrin ferment, the exudation clots. This clotted plasma with its entangled leucocytes is called *inflammatory lymph*, or *plastic exudation*. In other words lymph is clotted blood minus all or nearly all its red corpuscles. In the immediate neighbourhood of an inflamed part there is nearly always an excess of serous exudation as well.

Changes in the tissues. The inflamed tissue becomes swollen and softened. The swelling is due to the excess of fluid and leucocytes, and the softening is due partly to the soaking with exudation, and partly to the digestive action of the leucocytes, with which the tissue becomes crowded. Opinion has differed from time to time as to whether the new cells in inflamed tissue were derived partly from the connective-tissue corpuscles, or entirely from migrated leucocytes. It is now taught that some of these cells at least are the result of proliferation of the connective-tissue corpuscles. They are larger than the leucocytes and are called *fibro-blasts.*

TERMINATIONS OF INFLAMMATION.—(1) At any stage of the process, the inflammation may stop and the part may return to a condition of more or less perfect health. This is called *resolution.* If resolution occurs early, the crowding of the vessels diminishes and the circulation becomes restored; if it occur later after stasis has taken place, the obstruction melts away; if serum has been exuded, it drains away by the lymphatics; if plastic exudation has been poured out, the coagulated fibrin disintegrates and is removed by the leucocytes, which in turn either break up or disappear along the lymphatics.

(2) When the inflammatory process is severe the tissues may be so damaged that they liquefy under the combined influence of the exudation and the digestive action of the leucocytes. The latter which are in enormous numbers die for want of sufficient nutrition. The result is dead leucocytes floating in serum, or in other words *pus.* The process of formation of pus is called *suppuration.* When the pus forms a localized collection it is called an *abscess.*

(3) When the inflammation is near the surface of the body and causes a breach of continuity, the pus escaping externally, the process (essentially the same as suppuration) is called *ulceration.*

(4) Sometimes the inflammation is so intense that the whole or large part of the inflamed area dies en masse, before sufficient time has elapsed for it to become liquefied; this is known as *mortification, gangrene, sloughing, or necrosis.*

(5) Sometimes the newly formed cells become converted into fibrous tissue, the result being *fibrous induration* or *scarring.*

(6) Sometimes the newly formed cells degenerate owing to deficient nutrition and form a caseous mass. The more liquid

part of the caseous material may then become absorbed leaving only the calcareous constituents. These changes are called *caseation* and *calcification* respectively.

CAUSES OF INFLAMMATION. The immediate cause of inflammation is supposed to be some damage to the vessel walls, preventing them from performing their normal functions in controlling the osmosis of fluids between the tissues and the blood, which is the essential part of nutrition. This may be the result of either predisposing or exciting causes.

(1) *Predisposing causes* may be *constitutional* such as feeble circulation, anæmia, or impure blood the result of Bright's disease, gout, alcoholism, poisoning by mercury, lead, phosphorus, etc., or *local* such as congestion, loss of trophic nerve influence, loss of function, previous disease, etc.

(2) *Exciting Causes* are all some form of irritant, such as mechanical violence, heat, cold, electricity, chemical substances, the products of micro-organisms, or the presence of these organisms themselves.

THE SYMPTOMS OF INFLAMMATION may be divided into (a) *Local Symptoms.* These are:

Pain due to pressure upon or stretching of nerves. As a rule the pain is proportional to the amount of tension present.

Heat due to the increased amount of blood in the inflamed part.

Redness due to the increased amount of blood and dilatation of the vessels.

Swelling due to the increased amount of blood in the part and to the pressure of inflammatory exudation.

Disturbance of function due to impaired nutrition.

(b) *Constitutional symptoms.* The chief is fever, which subject will be dealt with subsequently: it is sufficient at present to point out that the fever in inflammation may assume three chief types (i) the *sthenic* in which the symptoms are acute, the pulse full, strong, and rapid, and the temperature high, (ii) the *asthenic* in which the strength fails, the pulse gets rapid and feeble and so called typhoid symptoms supervene, and (iii) the *irritative* in which delirium is a prominent symptom.

VARIETIES OF INFLAMMATION. Inflammation may be divided according to its intensity and duration into *acute* and *chronic*, or according to its cause into *traumatic*, *septic*, *infective*, *gouty*, *syphilitic*, *strumous*, etc., or according to its effects into *adhesive*, *suppurative*, *ulcerative*, *sloughing*, etc.

TREATMENT OF INFLAMMATION. The treatment may be divided into preventive and curative.

Preventive Treatment consists in avoiding or combating all the known causes of inflammation. Preventive treatment in inflammation assumes its greatest importance in dealing with wounds, either accidental or operative, where our object is to avoid the occurrence of any more inflammation than that necessary for the healing process. This subject will be more fully dealt with when we consider the subject of wounds and their treatment.

The curative treatment must be both local and constitutional.

The local treatment may be summarised as follows:—

When possible remove the cause, such as a foreign body, a carious tooth, etc., or any source of irritation, such as micro-organisms and their products, by the employment of antiseptics; tension by incisions or by drainage; irritating applications by substituting less irritating dressings, etc. As far as possible the inflamed part should have perfect rest, both mechanical and physiological.

The circulation through the inflamed part should be restored to the normal condition by means of elevation of the part, application of cold in the early stages, or heat and moisture where suppuration is likely to occur; astringents to diminish the calibre of the vessels under suitable circumstances; local blood-letting by incisions, scarification, wet cupping or the application of leeches to relieve the congested vessels.

Constitutional treatment. When the inflammation is due to a constitutional cause such as syphilis, the appropriate remedies for that particular disease must be employed. In ordinary simple inflammations no constitutional treatment is necessary beyond opening the bowels with a saline purge. In young strong subjects when the fever is high and of the sthenic type, antiphlogistic or lowering treatment, such as liquid diet, depressing drugs, (antimony, aconite, mercury), and sometimes, though rarely, general blood-letting by venesection, may be used. When the fever assumes the asthenic type, the treatment should be stimulating and supporting, the diet should be light, nutritious, and easily digestible, and combined with a suitable amount of brandy, or other stimulant, and drugs such as ammonia, quinine and iron should be administered.

Pain should be relieved by opiates or other anodynes.

CHRONIC INFLAMMATION.

Chronic inflammation differs from acute inflammation in that the process is less severe but of much longer duration; otherwise the pathological changes are essentially the same. Constitutional causes are of greater frequency and importance and local causes of less import, and often difficult or impossible to discover. The inflammatory exudation contains less fibrin-forming elements and is more prone to develop into fibrous tissue causing induration, but, as in acute inflammation, suppuration, ulceration, or caseation may result.

Symptoms. The pain is usually less severe, heat is often absent or slightly marked. The redness is more livid in hue or may be absent, but swelling is usually well marked. The constitutional symptoms are unimportant, being more often due to the general dyscrasia of which the inflammation is the result. Fever is mostly absent.

Treatment. Means should be adopted to improve the general health, especially when any definite constitutional disease such as syphilis or struma is present. Rest should be provided, and every discoverable source of irritation removed. The absorption of inflammatory products should be promoted by counter-irritation, by blisters, or iodine, friction, massage, shampooing ; the rubbing in of absorbent ointment, like oleate of mercury, Scott's dressing, etc., pressure by strappings or bandages, or application of the actual cautery.

CATARRHAL INFLAMMATION.

Catarrhal Inflammation, or catarrh, affects surfaces covered by epithelium. It most often affects mucous membranes, but also affects the skin in the disease known as eczema.

The inflammatory changes already described take place beneath the epithelial covering, and the products of inflammation escape through or between the epithelial cells upon the surface. The epithelial cells multiply rapidly, dividing into smaller and rounder cells, some of which are carried away in the exudation. At the same time an abundance of thin mucus is secreted and this mixed with the exudation derived from the blood forms the sticky watery discharge characteristic of mucous catarrh. Sometimes the number of small round cells in the exudation is so large that it becomes purulent in character. When the inflammation is sufficiently severe and prolonged the epithelial cells are destroyed and the result is an ulcer

SUPPURATION.

As already stated, when the inflammation is severe the tissue may become so crowded with inflammatory cells (leucocytes and proliferated connective-tissue corpuscles) that it melts away and disappears, its place being occupied by these cells floating in serum, in fact by pus. (Fig 2.)

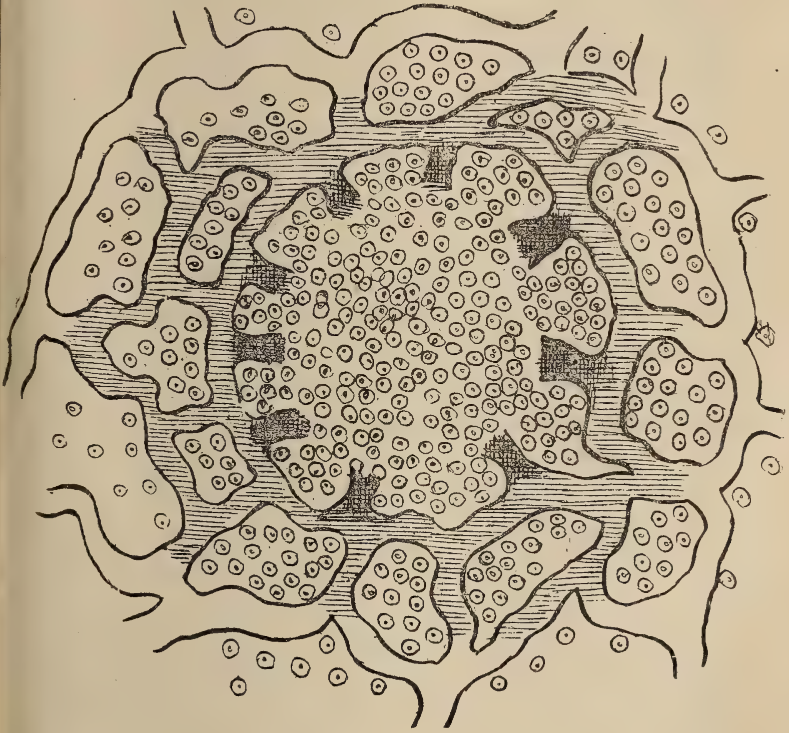

FIG. II.

Diagrammatic sketch of the formation of a small abscess. In the centre (abscess cavity) the tissues have melted away and nothing but pus is visible. The wall of the abscess is formed by congested and occluded capillaries and inflammatory cells.

Characters of Pus. Pus is a creamy, yellowish white opaque fluid of slightly alkaline reaction and a specific gravity of about 1030. It varies considerably in appearance under different circumstances, being sometimes thin and watery (ichorous), sometimes blood-stained (sanious), sometimes mixed with mucus (muco-pus), sometimes containing cheesy looking flakes (curdy). Under the microscope it is seen to consist of corpuscles floating in a fluid. The corpuscles are globular, granular, about 1-2500th of an inch in diameter, and contain two or three nuclei. They are dead cells and are derived from the migrating leucocytes and the proliferated connective-tissue corpuscles. The fluid portion is called *liquor puris* and differs but slightly from blood serum.

Pus may form in different situations in the body. When a definite collection forms in the interior of a solid tissue, the result is an *abscess.* Fig 2 represents diagrammatically the way in which this takes place. At the periphery are represented a number of congested capillaries from which small round cells are exuding in large quantities; nearer the centre the congestion is greater and many of the capillaries are thrombosed. In the centre of the diagram the tissues and capillaries have disappeared and only round cells are visible.

In some cases of acute inflammation the pus instead of forming a definite collection infiltrates the tissues; this is called *diffuse suppuration.*

In other cases the pus runs off from a surface, as in ulceration or purulent catarrh.

Causes of Suppuration. These are of course very much the same as those of inflammation. It is, however, very important to understand that a single irritant once applied produces simple inflammation which soon undergoes resolution, but if the irritation be kept up the inflammation continues and the excessive number of exuded leucocytes and proliferated connective-tissue corpuscles die from want of nourishment and form pus. In the great majority of cases (according to some authorities in all cases) the prolonged irritation which results n suppuration is due to the presence of micro-organisms. It should be added that any local or constitutional condition which lowers the vitality of the inflamed part renders suppuration more likely to occur.

The symptoms of acute suppuration are fever, usually accompanied by shivering (rigors), and certain changes in the inflamed part; the swelling increases and the skin over it becomes red, glazed and œdematous, so that it pits on pressure and in the midst of the inflammatory induration a soft spot can usually be detected. When the pus has formed in sufficient quantity, and near enough to the surface, an elastic feeling known as *fluctuation* is detected. If left alone the abscess becomes prominent at one place (*pointing*) and bursts.

Treatment. Endeavours should be made to prevent the occurrence of suppuration by removing every source of continued irritation, especially micro-organisms. When suppuration actually threatens, it may sometimes be prevented by the use of cold evaporating lotions. When the formation of pus becomes inevitable, it may be hastened by the application of warm, moist, antiseptic dressings. When pus has actually formed, the indications are to evacuate it with as little damage as possible to the tissues, to provide efficient drainage, and to place the part at rest and free from all sources of irritation.

Chronic Suppuration may occur either from a free surface, as in chronic purulent catarrh, and chronic ulceration, or in the form of a localized collection (chronic abscess). The process differs from acute suppuration only in being slower and less severe. A chronic abscess is usually due to diseased bone, joint disease or tubercular gland disease. It usually forms a fluctuating swelling with no active inflammatory characters, and no constitutional disturbance, unless it has been opened and decomposition of the pus has occurred. A chronic abscess may remain in *statu quo* for a long time or it may increase and burst, or the liquor puris may become absorbed leaving a caseous mass which may ultimately calcify.

MODE OF HEALING OF AN ABSCESS.

The bursting of an abscess is immediately followed by considerable diminution in the size of its cavity, owing to the pressure of the surrounding tissues. The inflammatory cells lining the abscess cavity arrange themselves into little pyramidal heaps called granulations, and the neighbouring blood vessels send minute capillary offshoots into their bases. The cells at the apices of the granulations float off in the serum, which is constantly exuding, and become pus cells, whilst those in the deeper parts, with the coagulated plasma by

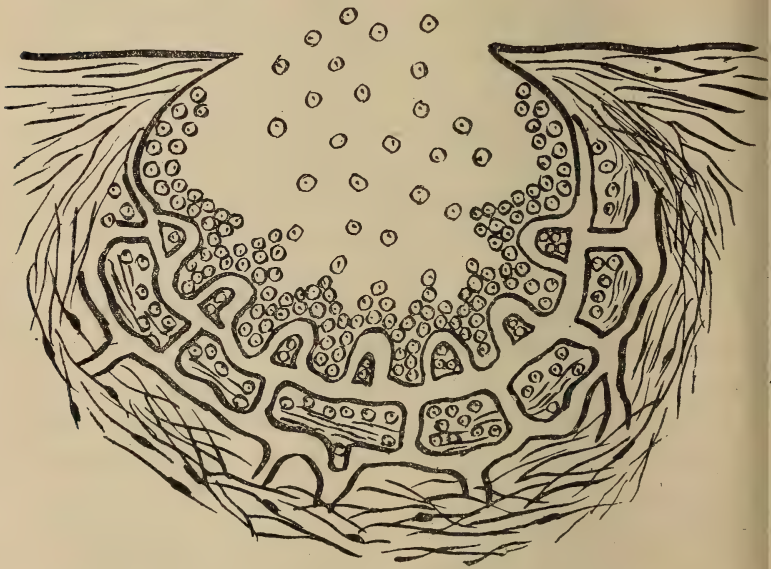

Fig. III.

Diagrammatic sketch of the healing of an abscess. The inflammatory cells have arrranged themselves into granulations, each containing a capillary loop. Pus cells are being exuded into the abscess cavity and fibrous tissue is being formed outside the wall.

which they are held together, become converted into fibrous tissue. This newly formed tissue shrinks, causing still further diminution in the size of the cavity. The granulations go on growing and becoming gradually converted into fibrous tissue until the cavity is quite filled up, and its former site occupied by a scar which becomes covered over by epithelium derived from the neighbouring skin or mucous membrane. The more the neighbouring parts will allow the new fibrous tissue to contract, the quicker the process of repair is; thus in abscess of bone the healing is slow as the cavity has to be entirely filled by the granulating process, no shrinking being possible. Sometimes an abscess does not heal completely, but contracts into a narrow suppurating track called a *fistula* or *sinus*. The walls of a sinus are usually thickened by fibrous tissue and lined by ill-formed granulations, and the orifice is usually surmounted by a crop of protruberant granulations. The degeneration of an abscess into a sinus is usually due to some foreign body such as a piece of dead bone or the root of a carious tooth, keeping up the irritation.

ULCERATION.

Ulceration is essentially the same process as suppuration. In both there is molecular death and disintegration of tissue following upon, and due to inflammation, and death of the exuded leucocytes and proliferated tissue-cells producing pus. In an ulcer the process takes place on the surface of skin or mucous membrane. An ulcer may be said to be an open abscess, and conversely an abscess may be said to be a closed ulcer.

An *ulcer* is an open sore or loss of substance of skin or mucous membrane produced by ulceration or sloughing. The floor of an ulcer is composed of granulation tissue and exactly resembles in microscopic structure the wall of an abscess Healing takes place in exactly the same way. Many different varieties of ulcer are described; these we need not consider at present, but it will be useful to summarize the various points which must be noted in describing the appearance of an ulcer for purposes of diagnosis or record. They are as follows :—

1. Number, size, and shape.
2. Situation.
3. The surface and the discharge—character of the granulations.
4. The edges, whether raised, undermined, sloping, sharply cut, etc.
5. The base. This means the part immediately under the surface of the ulcer. The base therefore cannot be seen. Its character must be determined by feeling, the important thing to ascertain, being whether it is indurated or not.
6. The condition of the surrounding parts.

GANGRENE.

Gangrene is death of a part *en masse*. Various conditions, such as Bright's disease, diabetes, heart disease, old age, etc., may act as predisposing causes by lowering the vitality of the tissues, thus rendering them less able to withstand injurious influences. The immediate or exciting causes of gangrene act either by cutting off the blood supply, or by destroying the vitality of the tissue.

The blood supply of a part may be cut off by obstruction of the main artery due to ligature, injury, thrombosis, and embolism, by obstruction of the arterioles by spasm,as in Raynaud's disease and ergotism, or by obstruction of the capillaries from pressure, as in bed sores. Obstruction of venous circulation may be a cause of gangrene by indirectly interfering with the arterial or capillary circulation. The vitality of a part may be destroyed by physical or chemical causes such as severe crushing, burns or scalds, frost bite, strong acids and alkalies, electrolysis, etc., or as already mentioned as a result of inflammation. It is especially in tissues which cannot yield or expand that inflammation is apt to lead to gangrene, for in these the exudation may lead to such tension, that the circulation through the capillaries becomes arrested, and the nutrition of the part stopped.

When gangrene has taken place the dead part becomes cast off by a process of ulceration in that portion of the living tissue in immediate contact with the dead. This process is called the formation of the *line of demarcation.*

The general principles of the treatment of gangrene are (i) To remove the cause when possible, (ii) To aid the removal of the dead part, (iii) To prevent decomposition as much as possible by the use of antiseptics, (iv) To support the patient's strength, and (v) to relieve pain.

(*To be continued.*)

MINERAL INLAYS.*

By HARRY ROSE, L.D.S. Eng.

THE method at present adopted by the profession for the production of Mineral Inlays is, to my mind, of a rather laborious nature, and consists in grinding and fitting, (with a corundum wheel) a stick, or section, of tooth porcelain, until it is adapted to the cavity in the tooth. This form of inlay can only be applied with success to simple cavities, viz., either round or with regular walls, and must depend entirely upon the skill and patience of the operator.

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* Read before the Students' Society, National Dental Hospital.

The plan I would advocate is to mould these inlays in the same way as one would mould an ordinary mineral tooth, that is by taking a small portion of unbaked tooth material, and mixing it to the consistency of thick clay, and then pressing it into a mould representing the cavity that it is required for.

Thus it would be unimportant whether the shape of the cavity be regular or otherwise; it could be fitted to the greatest nicety.

The conclusion arrived at, as the result of numerous experiments in this direction, is that the greatest difficulty one has to overcome is the shrinkage of the mineral, or tooth body, used for the inlay.

With the various dental porcelains in use, the amount of shrinkage may be reckoned at about one-fifth, and to allow for this shrinkage in the size of artificial teeth, the moulds for the same are made correspondingly larger. One cannot in the case of an inlay make that allowance, and the consequence is, that after fusing, it may be perfect as to shape, but one-fifth smaller, that being of course fatal to its appearance in the tooth.

The object of the present paper is to explain and illustrate a method for overcoming this difficulty.

Our first care must of course be to obtain an accurate representation and model of the cavity in Sullivan's cement. Now the cavity may be either simple or compound; the first would be represented by a hole in the crown of a molar, for instance, or in the side of an isolated bicuspid.

The second example is well shown in an interstitial or approximal cavity in a front tooth. This latter presents the greatest difficulty in obtaining an accurate impression, owing to the presence of the neighbouring tooth preventing the withdrawal of the plaster or composition, used for the purpose. I will therefore endeavour to explain how this impression can be obtained.

Prepare the cavity without undercuts, trim the edges so as to allow of withdrawal, either from the front or back, labial or palatal aspect, (preferably the palatal) of the small piece of composition or hard wax which should now be pressed into the cavity, (after previously oiling the inside) forming as it were a filling. A small pin of about the same size as that found in a mineral tooth should now be warmed and pressed into the wax filling,and should project backwards. Next lubricate the palatal surfaces of the teeth, and press a piece of softened composition about the size of a Barcelona nut against the teeth, this in its turn, when hard, is oiled, and another piece of composition is pressed against the labial surface of the teeth and extended over the points until it overlaps the first piece on the palatal surface which it is meant to support.

When hard the two pieces of composition are removed, then adjusted and firmly fixed to each other by means of a little hard wax.

The minute portion of wax or composition representing the filling in the cavity in the tooth, is now very carefully withdrawn, and placed in its position in the impression, formed by the two pieces of composition previously removed.

When accurately adjusted, plaster of Paris, or better still, some soft Sullivan's cement can be packed into the impression and allowed to harden.

This forms a model that can be handled with safety, and from which the inlay can be made.

Before the patient leaves, it is as well to match the colour of the teeth, and also to pack into the cavity sufficient dry wool so as to wedge the teeth apart and press the gum away from the cervical margin so that the whole extent of the cavity may be seen ; this will also afford more room and greater facility for the introduction of the finished inlay.

The Sullivan's cement model will represent the two teeth with the cavity in between, and as one could not very well remove the soft mineral inlay from such a difficult approximal cavity, it can be converted into an easy one at once by cutting away the tooth that is not required, and thus presenting a plain open cavity without any complications.

This may be deepened if found necessary, but on no account are the edges of the cavity to be interfered with.

The interior of the cavity in the Sullivan's cement tooth should be burnished and thoroughly cleaned before packing in the mineral.

If it is desired to fix a pin or other fastening in the inlay, a hole must be drilled, or a recess made, in the cavity, into which the fastening is placed, and the mineral packed around it.

Should the cavity be a deep one, a small piece of blotting paper may be cut so as to cover the floor of the cavity.

Through the blotting-paper is passed the top end of a small T-piece of platinum foil or wire, which thus rests upon the floor of the cavity, leaving an upright piece which is split (being formed of the two ends of the bent piece of metal) and afterwards folded back on the blotting paper.

The cavity before being filled with mineral should be oiled, the ends of the loop are then pressed through the blotting paper which is placed in the cavity, and mineral is packed in and afterwards dried.

When the inlay is removed from the mould, or cavity, after drying, it should be heated until red hot in a small platinum capsule, and the ashes of paper brushed away. A loop will then be found in the inlay, projecting according to the thickness of the blotting paper used.

The firing of the inlay is accomplished in the platinum capsule (or ferrule) by fitting it on the end of an ordinary tobacco pipe stem, this will serve as a handle to hold it by, whilst fusing the inlay under the blowpipe.

In the majority of cases, undercuts can be made in the inlay by means of the very small thin corundum wheels sold at the depots for use with the dental engine.

From an æsthetic point, these inlays are peculiarly adapted for cavities, interstitial or otherwise, in the front of the mouth to replace the ordinary cement fillings which wear away, and the gold fillings that certainly at present prevent the dentist from attaining the highest Art, if that indeed be "to conceal Art."

The material I use for inlays is a continuous-gum body, known as mineral compound and enamel, both of course modified and graduated in various colours, thereby enabling one to match the various shades of a natural tooth.

The method of moulding the inlay is as follows, and as an interstitial cavity is the only one that presents any complication, I will illustrate that.

First, clean, then oil the Sullivan's cement mould and adapt a small piece of pink wax to the cavity to restore the contour; oil the labial aspect of wax and tooth and adapt a small piece of A1, or other composition, to it.

When hard, remove composition from face of tooth, then remove wax from cavity in tooth, readjust composition to face of tooth and oil both that and interior of cavity. Now mix up to the consistence of putty two colours of mineral according to prepared shades, one for the base and the other for point of tooth.

The base or neck of tooth is now moulded and then the point of the tooth is completed with the lighter colour, the platinum pin is now pressed into place and the moulding of the inlay finished.

If the platinum pin is to be in the interior of cavity it must be placed in a previously prepared recess in the mould before the mineral is pressed into the cavity.

When the mineral is hard the mould is slightly tapped to loosen it and then it is carefully removed by means of a pair of delicate tweezers.

It is then dried and made red hot on a piece of platinum foil over the flame of a bunsen burner, after which it is placed in the little platinum capsule and slightly fused.

It may now be removed from the capsule, cooled and replaced in the mould for observation.

It will now be found to have shrunk somewhat.

We will now oil the mould again and introduce into it a small amount of body corresponding in colour to the inlay, which is then taken and pressed into the mould, squeezing out any surplus material not required; the inlay is contoured again with the soft material, and brought out flush with the edges of the cavity, and when the added portion is dry, and while still in the mould, may be painted over with enamel.

Once more the mould is dried, and then the inlay with added portion attached to it, removed and subjected to the same heating process as before, after which it is placed in the platinum capsule and heated until glazed ; it should then accurately fit the cavity in the tooth.

In the last firing the inlay may be steadied in the capsule by placing it enamel side up on a little powdered silex.

The firing may be easily accomplished by means of a foot blow-pipe, the platinum capsule being made to fit on to the end of a thick clay tobacco pipe stem, which serves as a handle to hold it by, while the hole in the stem carries away any steam or vapour that may arise from the soft material.

It might be imagined from this rather complicated description, that the process is a somewhat intricate and difficult one ; but such is not the case, the only disadvantage in the interstitial inlay being, that the work has to be done in two operations. Firstly, preparing the cavity and taking the impression; secondly, fixing the finished inlay into the tooth with Caulk's diamond, or Harvard cement.

With the proper appliances, firing the inlay is accomplished in a few minutes.

We must also take into consideration that to make an accurately fitting inlay in any other way for a cavity such as I have illustrated is well nigh impossible.

So to produce perfect results, in such case one must not begrudge the necessary time for the work.

Another method used may be the following :—

MOULDING THE MINERAL INLAY IN THE NATURAL TOOTH IN THE PATIENT'S MOUTH.

After adjustment of the rubber-dam, the cavity is prepared and any undercuts filled in with a little pink wax.

The edges are smoothed and bevelled, and the inside is then smeared with a thin coating of oil or vaseline.

A piece of tissue paper or gold foil slightly larger than the cavity is next pressed in and adapted to the walls by a ball of damp wool or a camel-hair pencil.

The damping of the tissue paper is necessary to prevent the too rapid evaporation of moisture from the mineral, during its manipulation.

The moistened mineral is pressed into the cavity with a burnisher or other suitable instrument, contoured, and then dried by means of the hot air blast from a syringe.

When dry the projecting ends of the tissue paper are used to withdraw the mineral from the cavity, the operation altogether taking but a very short time.

If the inlay is required for the grinding surface of either a molar or bicuspid, it will be necessary to make it conform to the opposing tooth, in such case, when the cavity is quite full of mineral, a piece of tissue paper is placed over the inlay and the patient directed to close the teeth for a moment, after which the drying of the mineral is proceeded with. Of course any clamp holding the rubber must be removed; the extra thickness owing to interposition of rubber does not matter, the shrinkage of material will account for that.

ADVANTAGES OF A MINERAL INLAY.

1. Extreme strength.
2. A platinum pin or other fastening can be inserted in it at time of moulding.
3. That in some cases it can be made hollow, with an undercut cavity in it.
4. That it can be shaded so as to conform to the point and neck of a tooth.
5. That the masticating surface can be properly contoured at one and the same operation.
6. That it can be made to match the natural tooth in glaze and translucency infinitely more perfectly than the glass inlays at present in use, whilst its resistence to a crushing force is far in advance of a low-fusing glass, and its adhesion to the cement more perfect.

These are a few of the valuable qualities of a mineral inlay; but there are others where more extensive reparations will call the mineral into use for the partial or complete restoration of the crown of a tooth.

ACTION OF SODIUM UPON WATER.—When metallic sodium is placed upon water a sudden explosion takes place, with decomposition of the water. The cause of this action has not been definitely settled, but from recent researches M. Rosenfeld concludes that a compound of hydrogen and sodium is formed which, through sudden dissociation, is the cause of the explosion.—*Pharm. Era.*

British Journal of Dental Science.

LONDON, AUG. 1st, 1894.

DEVELOPMENT OF TEETH.

It is scarcely more than half a century ago since anything like an accurate description of the origin of teeth was made known. Arnold, in 1831, and Goodsir, in 1839, working independently of each other, were the first to find out the homology of teeth with the mucous membrane covering the margins of the jaws. The latter observer described the "primitive dental groove" into which the formative "papilla" rose and passed through "follicular" and "saccular" stages. Guillot, 1859; and Robin and Magitot, 1860, were of opinion that the dental sac and its contents were closed from the first, and formed in the sub-mucous tissue. Huxley, however, showed that, so far as the enamel is concerned, the epithelium plays a part; the organ charged with the function of forming the hardest tissue of the body being derived from an invagination of the epithelium covering the mucous membrane. Kölliker corroborated this, and explained that the appearance of a primitive dental groove was due to the epithelium having been lost in Goodsir's specimens. Much good work has been done since then, and, in our own country, notably by the younger Tomes, whose investigations as to development enabled him to clear up points of difference in the structure of the completed tissues.

Associated with the general question of Development, is the one as to the relationship of different sets of teeth, in the same individual, to one another. Also the possibly still wider considerations as to the genesis of so-called compound teeth, and the occurrence of "supernumerary" or "supplemental" teeth, or even odontomes. Within the last three years a very large number of scientific communications have been made as the outcome of microscopical study, amongst them being some twenty papers by Dr. Röse. Last year we published this author's views on the development of human teeth, according to which both temporary and permanent sets are derived from a common "tooth-band" of epithelium, instead of the second series arising from the "necks" of the enamel organs of the preceeding temporary teeth. When, in a Mammal, both sets are present, which of them is to be regarded as the "primary" one, and which has been added, so to speak, for the benefit of the individual? Where only one set is present, does it represent the temporary or the permanent dentition? These are some of the questions alluded to and discussed in a very interesting contribution, by M. F. Woodward, to the current number of *Science Progress*. Dental students, and others interested in Odontology, will find that the recent accummulation of new facts adds a good deal to what has been the usually accepted teaching.

For instance, in the article in question, we are told that what has been considered the permanent dentition in the Marsupials is in reality a persistent milk dentition, an almost complete series of rudimentary germs of a second set of teeth having been discovered. In addition, it would seem that a still earlier dentition than the milk set has been found, denominated the *pre-milk* dentition. Further, both Leche and Kükenthal, in the case of the seal, and Röse, in the case of Man, have come to the conclusion that there are traces of a third set of teeth succeeding the replacing, or permanent set. This reminds one of the old tales about third sets being erupted late in life. At all events these investigations lead to the belief that living Mammalia show traces of from three to four distinct generations of teeth, reminding us of the polyphyodont dentitions of the Reptilia. As to the disappearance of the first of these sets, it is suggested that the development of the mammary gland, by providing the young with food, would do away with the function of these teeth, so necessary to the young reptile which must feed itself as soon as born.

To Parents and Guardians.—Those responsible for the entrance into student life of the future dental practitioner, should not fail to notice that some importance attaches to the registration of pupils before October 1st. At the last quarterly meeting of the Royal College of Surgeons of England, a report of the Committee on Bye-Laws was received and adopted. It recommends that the fee to be paid for the Licence in Dental Surgery should be increased from ten to twenty guineas, but that all persons duly registered as dental students on or before October 1st, 1894, shall be enabled to obtain the Licence at the present fee, we presume after the usual examinations. We do not find any new rule mentioned as to an additional fee for re-examination in case of failure, but considering the extent of the proceedings, which now generally last for a week, the new fee does not seem too high.

Phosphorescence.—Whilst Professor Dewar was investigating photographic action at low temperatures, he noticed that the apparatus he was working with was phosphorescing brightly. This led to further studies. He found, for instance that gelatine and celluloid were very luminous when cooled to 180 degrees below zero, and exposed for a second to the beam of a strong electric light. From other experiments, Professor Dewar thinks that the more complex a body is in structure, the more likely it is to phosphoresce. An infinitesimal quantity of organic matter being present produces enormous effect. A perfectly clean metal plate does not phosphoresce, but the trace of grease left by the touch of a hand, makes it brightly luminous. Oxygen and its compounds can be made to glow, but here a trace of organic matter destroys the effect. It seems that a drop or two of ether or scent in the room would make the experiment impossible for hours.

Co-Education.—An attempt has recently been made in America to discover the opinions of fathers and mothers who had been educated in "mixed" Schools and Colleges. They were asked to say whether they would send their own children to institutions where the two sexes are trained together, or co-educated. A letter was sent to 180 married women about forty years old, many with sons and daughters of college age. 133 ladies replied, of whom 109 declared in favour of co-education, whilst 3 strongly favoured separate schools. One, who approved, held that intellectually both sexes are stimulated and helped by association with each other, and that the habits of each are improved or kept from deteriorating, as is too frequently the case when either sex gets together in large numbers. Another thinks that in the majority of cases the friendship between men and women students are on a high level, founded on mutual intellectual and æsthetic tastes.

Legal Wisdom.—A grocer was fined £5 for selling a proprietary medicine containing a scheduled poison. He appealed, and his Counsel observed that it would be inconvenient for the poor if grocers were so prohibited. The Judge remarked " I think it would be a great advantage to the poor, because most proprietary medicines contain nothing at all, and those who use them are cured by faith." In another case, a lady sued a Ludgate Hill dentist for £6 for goods supplied. There was a counter-claim for two guineas for professional services rendered in taking a cast of the lady's mouth. His Honour said it was absurd for a dentist to charge for such a thing, and a boot-maker might just as well charge for measuring a customer's foot. From a third case we find that an action cannot be brought against a man for lying about his own goods, and he cannot be restrained from saying or advertising that his article is the best in the world.

Piperazine.—Dr. John Gordon has carried out a series of experiments, under a grant from the Committee of the British Medical Association, to test the solvent action of piperazine on uric acid. For the sake of comparison, several other remedies were tried at the same time. Borax, lithium citrate, sodium carbonate, and potassium citrate were allowed to act upon calculi, deposits, and artificially prepared uric acid placed in tubes containing urine, and kept in a water bath at 39 degrees Centigrade. Piperazine had a greater solvent action than any of the other substances. With a seven and a half per cent. strength, sodium carbonate had practically no effect; potassium citrate dissolved about 4 per cent. of the calculus in thirty-two hours; borax and lithium citrate 9 and 10 per cent.; whilst piperazine caused a loss of the calculus of 22 per cent. We should think that Dr. Kirk, who has been recommending lithium bitartrate for the dental manifestations of gout, will be interested in these experiments.

The Government Grant to Colleges.—The Treasury has accepted the recommendations of the Committee appointed to arrange the distribution of £15,000 to University Colleges throughout the country. The grants hold good without readjustment for the next five years unless the inspector should report in any particular case, a falling off in efficiency. Owen's College, Manchester, heads the list with £1800, and University and King's Colleges, London, come next with £1700. In the case of the latter, however, it is stipulated that Clause 12 of the King's College Act must be altered before next March. This clause imposes a religious test on officers of the college other than Professors of Oriental Literature and Modern Languages. We believe that some years ago a surgical vacancy was filled, presumably the best candidate being chosen, but, as he could not sign the required declaration, some one else was appointed. It seems that the College intends to refuse the proferred grant and retain its test.

Educating the Public.—The lay mind now-a-days has information presented to it in a variety of ways. Some of the popular journals are veritable mines of wealth, crowded with articles upon all sorts of subjects. From time to time we have been amused, if not instructed, by attempts to present the practice of dentistry in an enticing way. Now we have before us *Science Siftings* with up-to-date references to the employment of electricity for discovering dead teeth, possibly unerupted, for extracting, and for running "tooth-boring tools." Of course, crown and bridge work receive attention. "The demand for 'tooth-crowns' comes largely from athletes, who are very apt to have their teeth broken off short." Implantation, inlays, and the treatment of "crooked jaws" are next dealt with; cleft palate and pyorrhœa come later, and then we finish with histology and comparative dental anatomy. Amongst the palæontological information, we are told that there were human beings living 100,000 years ago who had three canine teeth on each side instead of one.

Acromegaly.—In the epitome of the *British Medical Journal* is a condensed account of the post-mortem examination of a case os this peculiar disease minutely described by Arnold. He alludes to the excessive growth of the lower jaw, which is so marked a symptom of this condition, in association with hypertrophy of the tongue and enlargement of the hands and feet. The pituitary fossa was increased in size, and degeneration of nerves, vessels, and muscles was present. The nerve changes in the brain and cord were regarded as secondary to vascular changes. The hypertrophy of the pituitary is considered as the cause of the affection. The author's researches tend to show the growing importance in the relationship of pituitary and thyroid diseases to changes in the nerve centres, peripheral nerves, and their muscles.

American Pride.—In response to an address of welcome to the Mississippi Dental Association, Dr. G. B. Clement spoke as follows :—" We are proud of dentistry in Mississippi, we are proud of dentistry in the United States, we are proud of American dentistry, because American dentistry leads the world. I make this statement openly and boldly, yet, not without proof, for it was my good fortune to hear all Europe, Asia, Africa and the isles of the sea acknowledge the supremacy of American dentistry, save Great Britain, and it was this assertion advisedly made that caused old England to officially withdraw all patronage and refuse to participate in the greatest association of dentists ever known in the history of the world, an association represented in person by almost every civilized nation upon the face of the earth." Patriotism accounts for a great deal, and in our case it may also be held to explain the separation of "old England" from the other "isles of the sea."

Pauper Children.—The massing together of large numbers of pauper children at one Institution has recently come in for much criticism, especially since a charge of cruelty against a nurse has been made public. The so-called " Barrack Life" has been much condemned, and a Boarding-out System recommended. But even this latter has its drawbacks, and it can scarcely be expected that *any* system will give such good results as one might wish. The particular class of the community from which the inmates of such an institution are drawn, should always be borne in mind. Again, the management at such places is not always upon uniform lines. At one with which we are acquainted, the boys are allowed out " on pass" by themselves, and many of the arrangements, both of training and recreation, remind us of the big " public schools" at which so many of our aristocrats receive their education, and to which, afterwards, they are so anxious to send their sons.

Abstracts of British & Foreign Journals.

ON THE RELATION BETWEEN DISEASES OF THE TEETH AND EARS.

By Robert Barclay, A.M., M.D., St. Louis, Mo.

It was with a view to directing attention more generally to the important relation between the diseases of the teeth and ears that this discussion was originally undertaken.

It may prove advantageous to commence by some remarks on the distribution and characteristics of the nerves by which the teeth and ears are physiologically connected. As is well known, the trigeminus, or fifth cranial nerve, is pre-eminently and almost exclusively the basis of this connection. With its dental distribution practitioners of dentistry are peculiarly familiar. Respecting its terminal filaments in the ear, however, I need only refer to the fact that the greater part of the auricle and external meatus are supplied by its auriculo-temporal branch. By neural anastomosis, as well as through the Gasserian ganglion, we find the dental nerves still further connected with the ear. The tensor tympani, tensor palati, and tympanic plexus, receive fibres from the otic ganglion; the tympanum is supplied as well with filaments from the carotid plexus of the sympathetic and from the great superficial petrosal (from the Vidian).

The trigeminus consists of motor and sensory fibres; fibres having vaso-motor influence over certain regions, notably the ear; and so-called "trophic fibres," upon whose functional integrity largely depend nutrition and reactive power in the regions supplied by this nerve. Such being its character, is it at all astonishing that it should have proved the exemplar, *par excellence*, of nerves in which disorder or disease at one terminal branch produces disturbance at another? And the neural connection between the teeth and ears being so definite and so intimate, what is the rationale of presuming these organs exempt from that which obtains for the others similarly connected by this nerve? For, that this takes place among the others, we have abundant testimony from many eminent observers. For instance, "reflex neuralgia from the pharynx probably through the palatine ganglion to the superior maxillary nerve," characterized a case reported by Dr. J. Orne Green, of Boston, Mass., where the contact of a Eustachian catheter with the mucous membrane, near the mouth of the Eustachian tube, was, at each repetition, attended with severe pain in the teeth of the upper jaw of the corresponding side. "Spasm of the muscles of mastication from irritation reflected through their nerves from another branch (the auriculo-temporal) of the trigeminus" is known to occur from the fact, as stated by Dr. Ambrose L. Ranney, of New York, that "the tempero-maxillary articulation has often been known to assume a condition of immobility during an attack of earache, and to be immediately relieved by the application of an anodyne to the terminal filaments of the fifth nerve in the auditory canal;" and in this connection, Dr. Ranney speaks of having under treatment a patient who, after having in vain submitted to aural treatment for earache of supposed inflammatory origin in the ear, was promptly relieved of this symptom by "a simple gargle of opium, held for fifteen minutes in his mouth at intervals," his aural neuralgia having been reflected through the trigeminus from "an obstinate ulceration of the tongue." If the occasion demanded, one might multiply indefinitely reports such as these, attesting the intimate relationship between other branches of the trigeminus.

Now as to a demonstration of such connection between the teeth and ears. Hilton has reported a case where a very painful ulcer of the external auditory canal obstinately resisted all remedial measures until the extraction of a carious upper tooth, which promptly cured the aural disease. The writer has met with a case of verruca of the auditory canal, very painful, which, after removal, recurred several times during a year; but which, after the extraction of several carious teeth upon the corresponding side, was removed and never returned.

In speaking of aural neuralgia associated with a distinctly diseased tooth upon the corresponding side, other causes and varieties of aural neuralgia being excluded, and where not even a slight connection between the tooth and ear can be made out, Dr. Orne Green says, "Of course the diseased tooth requires attention, and in all the cases of this form which I have been able to follow, the appropriate treatment of the tooth, either by filling or extraction, has cured the neuralgia." Dr. Bruns, of New Orleans, in reporting twenty-three cases whose "ears" were not "normal," of whom nineteen had "hearing" that was not "good," states that there were nineteen cases in whom the "hearing" was more defective on "the side on which the teeth were worse." Dr. Samuel Sexton, of New York, in speaking of "the special sense-organs,—the ear, nose, and eye,"—states that "under certain conditions of the system" "these organs become strikingly susceptible to disturbing influences, and, so far as his own experience goes, from no cause more frequently than from dental irritation." Again, he says that of fifteen hundred aural cases, whose records he has received, "perhaps one-third owe their origin or continuance, in a greater or less degree, to diseases of the teeth."

With a report of twenty cases of aural disease where dental irritation was obviously either a predisposing, exciting, or sustaining factor, the writer cited, "among the principal conditions giving rise to aural irritation," and, indirectly, to ear-disease, "cutting, crowding, shedding, and caries of the teeth, gingivitis, hyperostosis, pyorrhœa alveolaris, periostitis (pericementitis), tartar, hypertrophy of the gums, catarrhal inflammation of the buccal mucous membrane, vulcanized red-rubber and ill-fitting plates and 'dentures,' numerous amalgam fillings, and unskilful dentistry.

A case of peculiar interest to the dental surgeon, hitherto unpublished, is this: A gentleman, aged thirty-six years, had, about four years previously, suffered for almost two months with a discharge of pus from the left ear. Subsequent to the cessation of the otorrhœa, he had been annoyed by reverberation of his own voice when speaking, by a ringing sound, and by neuralgia in this ear. The whole left side of his head had felt dull. Supposing himself subject to nasal catarrh, he had resorted to self-treatment. On examining his left ear, the canal was found to contain cerumen in abundance, but not sufficient to wholly close the lumen of the canal. Physical signs of rhinitis were slight; but upon examining his pharynx and mouth, there was discovered what the writer thought to be a small left superior third molar, seemingly impacted directly against its neighbour, and but partially through the gum. By carefully removing the cerumen from the ear, and then inflating the tympanum, the patient was relieved but partially. He was directed to have the crowding molar removed, but did not do so until after what he deemed a reasonable time had elapsed without disappearance of his symptoms. In extracting the offending member, however, the dental surgeon brought away its neighbour, with which it was closely intertwined and conjoined. This curious specimen—which the writer has been informed is a third molar and supernumerary wisdom-tooth—is still in his possession. Very significantly, upon the morning after the removal of this anomaly from the jaw, the patient awoke relieved of all his symptoms, which have never recurred.

A young man, twenty-seven years of age, who for fourteen years had been working in a noisy shop, had for several years noticed a marked deafness in conversation. His family physician also had remarked it. The patient was annoyed as well by noises in his ears, and, at times, by an unnatural reverberation of his own voice when speaking. His ear-drums had apparently undergone changes characteristic of catarrhal otitis media. Of his teeth, the right superior first and second bicuspids and first molar were missing; there were carious, the right superior lateral incisor and cuspid, the right inferior cuspid, first and second bicuspids, and third molar (the last having its pulp exposed), the left superior lateral incisor, cuspid, first and second bicuspids, first and third molars, and the left inferior second bicuspid, first and second molars. On the left side, the pulps were dead in the lateral incisor, cuspid, and first molar. Of the first bicuspid, the roots only remained. There was a supernumerary wisdom-tooth on the outer side of the left superior third molar. There was tartar on the front teeth; on the labial surface above, on the lingual surface below. Treatment directed toward his aural condition availed little until the patient adopted the suggestion to have all dental irritation removed. Aural treatment was then suspended, and he attended upon his dentist until all teeth with dead or exposed pulps, and the left superior third molar with its supernumerary tooth, had been extracted, cavities filled, tartar removed,—in short, until all dental irritation had been quieted. The dental treatment has been attended by the happiest results, the patient's symptoms having been ameliorated and his hearing improved promptly and steadily thereafter.

The writer, himself, upon one occasion, was relieved of an earache by proper treatment of a minute cavity on the buccal aspect of an inferior third molar.

Cases of aural neuralgia and inflammation have been encountered by the writer, which resisted treatment until after the removal of a tooth containing a pulp-nodule. One of these occurred in the case of a prominent dentist.

The irritation from pulpless teeth is one of the most insidious and prolific factors in aural disturbance. One case, recently relieved by extraction of a tender right superior second molar, proved to be due to a small alveolar abscess of the internal root. The tooth had a continuous crown and distal amalgam filling, and, on breaking open the internal root, the root-canal was found to contain a piece of gold wire, which had doubtless been introduced therein under the delusion that it might prove a suitable filling, the crown cavity finally being closed with amalgam.

Whether or not, from the standpoint of conservative dentistry, it be advisable to introduce gold wire into a root-canal and then hermetically seal it ; or, when one has broken a broach or other instrument in the root-canal to leave it, "saturate with oil of cloves" or "other essential oil," fill with chloro-percha" and "keep it dark," is a question upon which the writer would not presume to express an opinion ; but he thinks that the continued presence of a solid, metallic foreign body in the root-canal of a tooth, hermetically sealed, even if the foreign body be not pushed through the apical foramen, is, as studied from the lessons of practical aural surgery, a procedure of doubtful expediency. And it would not seem infrequent for the metal to be forced actually through the apical foramen, when at a convention of dentists recently it seemed to an experienced and observing member "that every brother had one of those specimens, with the point projecting from one-sixteenth to one-quarter inch, in his pocket."

Insidious dental irritation reflected to another branch of the trigeminus, if its terminal distribution seem anatomically remote, is apt to escape the attention of both dentist and medical practitioner. In such case, the patient, with, for example, neuralgia of the supra-orbital nerve, or with disturbance on the auriculo-temporal nerve, as with earache, would hardly think of seeking aid therefrom of any but a physician. In his ignorance of the anatomy, physiology, and pathology of the trigeminus nerve and its communications, he would never suspect the origin, the source of his trouble, and go to his dentist. On the other hand, should the physician prove negligent or incompetent, and overlook such dental irritation, all would be in the dark as before. It behoves the physician, therefore, to be alert to discover and to apprise the practitioner of dentistry of any untoward results remotely attendant upon the various procedures of his craft, of which he and his fellows might otherwise remain perpetually unaware. And as both are brethren in the noble art of healing, the dental practitioner should duly consider such testimony of the physician and endeavour to so modify his procedures and practice as to rid it of all, even the most remote, deleterious influence.

The Dental Cosmos.

NECROSIS OF THE LOWER JAW IN CHILDREN.

By Wheelton Hind, M.D., B.S., F.R.C.S.

Necrosis of the lower jaw is a rare disease apart from phosphorous or mercurial poisoning, and little is to be found on the subject in text books.

During the years 1890 and 1891 I saw an extraordinary number of cases of this disease at the North Stafford Infirmary, many of which by the courtesy of one of my colleagues came under my own care, while I also had the opportunity of seeing others under the care of my other *confreres*. The history of the disease was as follows : The patients, all children, aged from three to nine years old, and, therefore, in an active state of dentition, were all brought up for a swelling at the angle of the jaw, in all cases but one unilateral. This swelling was hard, non-circumscribed, and on examination of the mouth, there was usually a discharge of pus from the gum behind or near the last cut molar. In a few cases there was also an external sinus. A probe passed into the sinuses came down on bare bone. There was comparatively little fœtor, but owing to the infiltration of muscle, or due to the inflammation of its attachment to the jaw, there was some difficulty in opening the mouth, but there was very little pain after the discharge became developed. The little patients exhibited a characteristic appearance with the much-swollen cheek and absence of any constitutional affection, the majority appearing in fairly good health. They came from all parts of the towns of North Staffordshire, belonging to the poorer classes, and were equally divided between the sexes ; none came from the country districts, or were over nine years old, and there was no history of any mercurial treatment, or exposure to the fumes of phosphorus. It was very improbable, too, from the absence of other symptoms, that any phosphorus had been accidentally absorbed from sucking lucifer matches, and from the non-fatal character of the disease. The limit in time of the epidemic is marked. No cases were seen before 1890, and none have been seen now for more than a year, and this fact has led me to think that one great factor in the causation of this affection was a series of widespread epidemics of measles which attacked the district in the years 1889—90—91, though I must confess that a history of measles was not obtained in all of the cases. I think, too, that the limit of age points exclusively to the fact that the growth and eruption of the permanent six-year-old molars played an important part in the ætiology of the disease, and this I consider to have been the determining factor in the causation of necrosis. In several cases I found lying loose or impacted in the necrotic bone the crown of the six-year-old molar, quite separated from the pulp organ, and without any connection with soft material. The crowns were in all cases fully formed, but there were no signs of fangs or roots, and the tooth seemed to occupy the centre of disease, for, as a rule, the necrosis was limited to the alveolar process posterior to the milk molars and the anterior part of the ascending ramus. It, therefore, seemed to me that the probable train of events was—first, an interference with the growth of the first permanent molar, due to the low state of health induced by zymotic disease , and secondly, death of the tooth, which, acting as a foreign body, set up necrosis in the surrounding jaw.

The treatment I adopted in all cases which came under my care with necrosis] already developed was to improve the general health with cod liver oil, syrup of the iodide of iron, and good feeding. Antiseptic mouth washes of boracic acid, chlorate of potash, and myrrh were used until there was evidence of the sequestra being loose, and when such was the case to make an incision between the gum and the cheek posterior to the milk molars, which I also removed if their bony sockets were involved in the disease. Then with a small pair of bone or dressing forceps, to remove all the dead bone, making a special point of searching for all loose crowns of the permanent teeth which might be in the necrotic cavity.

In the majority of cases the necrosis appeared to be limited to the outer surface of the jaw, chiefly the alveolar portion and the ascending ramus being affected, but in one case (that of a little girl aged three years), where the disease was bilateral, I removed the whole of the ascending ramus and condyle from one side (the left), and a large sequestrum from the surface of the bone with the condyle of the right. A great deal of the swelling in these cases is due to the rapid production of new bone round the necrosed portion ; and, indeed, this fact is a very important feature in the subsequent process of healing. I have been struck in all cases with the very rapid reproduction of the jaw, and the absorption of the swelling around, there being, in the cases I have been able to keep under observation, very little resulting deformity. Even in the case where both condyles were removed, the rapidity with which the power of mastication returned was marvellous. I saw one case in a lad who gave no history of measles, or other zymotic illness. Here the trouble did not end till the impacted crown of the six-year-old molar was removed, and it is quite possible that the case does not belong to the same category as the others, and was due to cystic expansion of the jaw owing to an impacted molar. This was one of my earliest cases ; I was, I must confess, puzzled over it. The slow growth, age of child, and general health, made me think of sarcoma, and I prepared the parents for the necessity of the removal of half of the lower jaw ; but he came under one of my colleagues, who explored, after finding pus welling up into the mouth and removed some dead bone. Subsequently the case came into my hands for another operation, whilst taking charge of my colleague's cases, and as more bone was loose, I operated for its removal; but a third operation becoming necessary, I felt that there must be some cause of irritation remaining, and found the six-year-molar impacted, which was absent from the denture, lying obliquely in the horizontal ramus of the jaw. This I removed, and a rapid cure resulted.

The history of swelling and the formation of ossifying callus that I have noted differ from the experience of Mr. Salter, who states in his article on Diseases of the Teeth in "Holmes' System" : "There is no swelling, and no ossifying callus is formed in the region of the necrosed bone." It was by this observer that the connection of jaw necrosis with the exanthemata was first pointed out ; and he says in nine years he saw twenty-three cases. It would have been interesting to note whether they occurred in epidemics or sporadically.

In one case only, and that in private, did I see the first symptoms of the disease. It came on very rapidly soon after an attack of measles, and after the swelling had lasted two days, I made free incision down to bone, along the posterior part of the gum, with the happy result of arresting the disease. I felt a lot of bare bone which was evidently, however, not so far diseased as to go on to necrosis. Judging from this case only, the disease would appear to approach more nearly to the acute periostitis of other bones, and it is quite possible that the poison of the exanthem would find a suitable nidus in that tissue as well as in the pulp organ, and if this is the more correct interpretation of the pathology, the treatment of free incision is that most likely to result in the saving of the bone.

As to differential diagnosis. Sarcoma of the jaw is the most likely disease to be mistaken for this disease, but the welling up of pus or formation of abscess will point to necrosis. Cases of dentigerous cysts will of course also closely resemble necrosis with swelling, and the line of treatment is the same, viz., to cut down and remove the necrosed bone and the impacted tooth.

The Hospital.

SOME DISEASES OF THE GUMS.

By D. M. Sabater, D.D.S., M.D., New York.

The pathological lesions which are liable to attack the tissues of the gums are very numerous, and only those of more common occurrence are here dealt with.

They may be conveniently divided into two groups: Those with a direct, and those with an indirect origin, or emanating from other than external pathological disturbances, the former due to local, and the latter either to local or systemic causes. Mucous patches, stomatitis, and pyorrhœa alveolaris are local manifestations of constitutional disturbances.

As is well known, gingivitis marginalis is a temporary condition of hypernutrition of the gingival margin and of th gums in general associated with the ordinary essential phen mena of inflammation—namely, pain, heat, and swelling with disturbances of function and nutrition, varying in intensity, extent, and duration. The non-essential phenomenon of inflammation is redness, which, although in this disease it plays an important part, is absent in some cases of inflammation.

Etiology.—Gingivitis arises from a direct mechanical or chemical irritation, inducing a disturbance of the cell elements of the parts involved. The principal mechanical and chemical causes are calcareous deposits, the presence of green stains which have strong acid reaction, excessive cleaning, or the use of unsuitable brushes with wide and strong bristles, or deleterious substances found in the composition of some tooth-powders. The use of charcoal and pumice-stone should be condemned not only for their irritating tendency, but also owing to the causing by the former of a well marked pigmentation or tattooing of the gums.

Treatment.—Thorough cleaning by means of scalers of the proper form and size, followed by the judicious use of astringent washes. In severe cases, Tr. iodi. may be used with antacids, such as bicarbonate soda one drachm, to aqua eight ounces. In chronic cases, besides the above treatment, the author uses first, a four per cent. solution of cocaine over the surface of gums, and, five minutes after, a massage of oil of peppermint, oil of camphor and aristol.

The following is beneficial in gingivitis :

R Tr. krameriæ, 1 ounce ;
Tr. opii, 2 drachms ;
Tr. myrrhæ, 1 drachm ;
Aquæ camph., 7 ounces.
To be used as a wash.

Epulis is a firm tumour of slow growth and variable size, springing from the margin of the periosteum. It often arises between the teeth, and, most commonly, on the labial side. It is either benign or semi-malignant in character ; the former is fibrous or granular, and the latter, sarcomatous. The differential diagnosis is made by their manner of growth, their form, and their local manifestations. The fibroid, or benign, presents a flattened base with a distinct narrow pedicle (mushroom like), is not extensive, resembles the gums in colour, and is of slow growth, while the sarcomatous is sessile, extending into the neighbouring tissues. It is of a deep colour, presenting a dark red or purplish spot ; bleeds easily when touched, dislodges teeth from their normal position, loosening them by destroying the alveolar sockets.

The *causes* are difficult to determine, especially in the benign form. It may be traced to the presence of a local irritation, as badly decayed and broken teeth, roots with ragged edges or crowded teeth. The semi-malignant epulis, in the majority of cases, is caused by violence and mechanical injuries, as falls, blows, etc.

Treatment consists in the removal of the tumour either by ligatures or curved scissors, applying chromic acid or chloride of zinc, sixty grains to one ounce of water, to destroy completely its roots and prevent recurrence; or, better still, operate with the galvano-cautery, when applicable. In cases of sarcomatous epulis, the operation consists in the removal not only of the neoplasm, but the surrounding structures, including teeth, alveolus, and periosteum, using chloroform as an anæsthetic.

Actual cautery in cases of persistent hæmorrhage, and rigid antiseptic measures should be observed, such as solution of bichloride of mercury 1 to 2,000, carbolic acid, creoline, hydronapthol, aristol, iodoform, peroxide of hydrogen, trichloride of iodine, etc.

Carcinomatous or heterologous tumours are sometimes found primarily on the gums. They consist of epithelial cells found in an abnormal situation, and extend deep down into the substance of the gums. The most common is rodent ulcer, or flat cancer, changing to epithelioma. It travels through the system by the lymphatic channels, presenting glandular enlargements. The softer and more juicy the tissues affected, the sooner they are involved; when denser, there is retardation of this process. The younger the patient, the easier and more rapid the infarction of glands. I have seen two cases where there was no enlargement present, one person fifty-five and the other sixty-four years of age. The bed of the excavations presented an unhealthy condition, marked by a distinct, pale, flabby appearance, with everted edges and total absence of granulation. It is generally found in the area of the molar teeth. Its growth is rapid if occurring after middle age—a characteristic of all malignant tumours—but if it occurs in early life, its growth for many years is slow.

Causes are obscure, but they may be traced to a constant and prolonged irritation.

Treatment.—The same as in sarcomatous, though more extensive. Should there be a great infarction of the lymphatics and increased symptoms, the operation is of no value, as in these cases the prognosis is generally bad.

Mucous patches are syphilitic sores which may be located at any place upon the mucous membrane of the oral cavity. They appear as white ulcers, which become deep and change to a red colour, with raised edges and indurated surface and base, being always accompanied by other rational symptoms of syphilis.

Treatment.—Internally, by the so-called mixed method, consisting of hydrarg. protiodide or bichloride, and potass. iodide. Externally use caustics and antiseptics.

Stomatitis is a disease characterised by elevated small patches, like blisters, presenting all the local symptoms of inflammation, and followed by more or less ulceration of the gum's tissue; in some cases it covers a circumscribed territory, and in others often involving the tongue and cheeks.

Causes.—Some direct local irritation, as dental caries, extremely warm or cold drinks, corrosive substances, or the consequences of an altered systemic condition, from fevers or impairment of the digestive functions, excessive stimulation or smoking.

Treatment.—Immediate removal of sources of irritation, disinfectants and mild caustics on ulcerated surface. Should there be a low tone of health, occasioned by other diseases, give alteratives, tonics, and moderate exercise in the open air. In painful and extensive cases, use the following:

R Cocaini hydrochloratis, gr. iss;
Sodii chlor. gr. xv.;
Glycerinæ, dr. ii.;
Aquæ, dr. iii.

To be applied on the gums with a camel's hair brush, and spray frequently with a solution of boracic acid. Internally give bromides.

In cases of fœtor of breath, use—

R Liq. sodii chlor., oz. iss;
Dec. cinchonæ flav. oz. v;
Mellis rosæ, oz. iss;
Spr. caryophilli, drops iv.
For mouth-wash.

Pyorrhœa alveolaris, also known as phagedenic pericementitis, Rigg's disease, pyogenic gingivitis, loculis alveolaris, etc., is a local manifestation of a systemic disturbance, which is due to the action of remedies exhibited for the relief of some constitutional disease. He refers to the preparations of mercury. It is a well known fact in medical practice that the salivary glands become excessively irritated under the influence of this remedy, and their functional activity is increased to such an extent that an enormous quantity of saliva is secreted and poured into the mouth. It is also well known that ptyalin (organic ferment and active principle of saliva) has a very irritating effect upon the gum tissue, resulting in inflammation which cuts off its nourishment; the result is, its detachment from the neck of the teeth, thus forming pockets, which are the chief and constant characteristics of the disease, and are receptacles for particles of food, epithelial scales, fats, etc., forming a mass soon to be infiltrated with lime salts. Here we have the beginning of salivary calculus, which through its irritation of the adjacent periosteum is being constantly added to by the lime salts thrown out by that membrane. This he believes to be the etiology in the majority of cases of true pyorrhœa. In other cases it is due to an early neglect of the teeth, when particles of food are allowed under the margin of the gums. The disease may be circumscribed or diffused, of slow or rapid course, mild or severe in character. In an acute type there is generally a creamy pus discharge, while in the chronic form it is usually watery. In some cases a false abscess is formed at the molar region, presenting an intense inflammation or discharge and great tenderness of the tooth, so that it may be mistaken for a true alveolar abscess from devitalized pulp. The application of a small piece of ice on the suspected tooth will reveal the true diagnosis. There are other conditions which cause loosening of teeth, as atrophy of roots, a rare occurrence and differentiated from pyorrhœa in the absence of pocket formation and discharge, the gum showing a distinct anæmic condition.

Treatment consists principally in thorough scaling and removing of foreign matters, avoiding laceration of gums as much as possible; firm ligatures, to get proper fixation and to avoid movements; also accurate articulation must be obtained; judicious scarification of gums occasionally to relieve congestion, which is always present; removal of offensive decayed roots, and administration of saline cathartics from the onset; strong tonics and most nutritious diet, and the use of antiseptics, alternatives, astringents, and mild caustics. He uses, first, hydrogen peroxide with Farrar's syringe, and then warm aqua cinnamomi to clean out pockets. On a second treatment follow the warm water application with a mild solution of the nitrate of silver. The systemic treatment varies, as it must be in accordance with the history of each particular case. In cases of severe pain, use morph. sulph. gr. ii, aqua camph. dr. ii, externally around pocket, and internally chloralmid, gr. iii, sodium bromide gr. viii, to be taken in water at bedtime. In cases of great detachment of gums, use mild solution of chloride of zinc.

The latest remedies used in cases of pyorrhœa alveolaris, and which are highly endorsed, are trichloracetic acid and pyrozone.

International Dental Journal.

ON THE POSSIBILITY OF AVOIDING METALLIC CLASPS IN PARTIAL DENTURES OF VULANITE.

By Dr. D. Caracatsanis, Athens.

I have frequently read in the dental journals how metallic clasps are destructive of the teeth, but I have never seen the faintest suggestion as to how this untoward result may be prevented or how the plate may be kept in place almost without any clasp. I feel very sure, however, that they may almost always be avoided.

I place a single incisor in the upper jaw with the greatest ease with a plate of small dimensions and without any clasp, by means of white caoutchouc. To insert two teeth, I take advantage of a vacant space produced by the removal of a tooth, or of a natural space between two teeth for fastening the extremities of the caoutchouc, instead of using clasps. With points of support which have seemed insignificant I have been able to anchor a denture of eight or ten teeth very solidly, the plate being the width of a centimeter or a centimeter and a half at most. There are cases of course in which it is impossible to do without clasps, for example where we have to deal with an incisor of the lower jaw, all the other teeth being in place and in close contact.

I have seen abuses of the clasp method, as for instance of a partial upper denture carrying by means of metal clasps the second right bicuspid, the right lateral incisor, the left central incisor, left cuspid, and the second left bicuspid. At the end of a year the teeth were entirely loosened, the tooth-structure worn away by the friction of the metal, and the patient suffered intense pain in the teeth from changes of temperature. I replaced the piece with one without a clasp, taking care to avoid the slightest pressure on the loosened teeth, and securing the retention of the denture in place solely by rubber clasps affixed as the preceding ones had been to the first molars. The piece kept its place as well as its predecessor and the plate was no larger. The advantages to be derived from this plan, which concern not only the patient but also the dentist, are economy of material, since metal is avoided; economy of time, and the facility of making a light plate which causes no inconvenience to the patient.

Dental Cosmos.

IMMEDIATE PROSTHESIS.

Dr. Gordon's exhibit of so-called "Immediate Prosthesis" originally introduced by C. Martin, of Lyons, France, was one of the extremely interesting exhibits at the Columbian Congress. One was a hard-rubber piece to substitute for a portion of a jaw and teeth which had been resected on account of disease. This piece was made before the surgical operation, measurements having been made for size and shape. Immediately after the operation the piece was placed in position and screwed to the remaining portion of the jaw. It was simply a temporary appliance to prevent the falling in of the parts where the muscles are inserted, and after being worn a few months, its object being accomplished, it was removed and replaced with a hard rubber plate and teeth of similar form.

Also soft-rubber vela to be attached to hard-rubber plates for closing fissures in the soft palate. In constructing this apparatus, he dissolves rubber in chloroform and paints it over his matrix or mould. In this way he avoids air-spaces and consequent porosity after vulcanization. In one case the velum is hollow and subsequently partially filled with water, to make it more adaptable to the soft parts. This is done by vulcanizing it over a plaster core; then the piece is punctured at some point and the plaster removed through the opening, and partially filled with water and closed by means of a disk or washer and screw, by which also the attachment is made to the plate.

Ohio Dental Journal.

THE PROPERTY IN A TOOTH

Nowadays (says "John Doe" in the *Brief*) everything is made in Germany. They are just upon the point of making a leading case there which should be of interest to lawyers all the world over. It arises out of the tale of a tooth. A German gentleman had a tooth that agonized him, and he went to a dentist to have it out. Now they are both going to have it out—in another sense—in the law courts ; because an important question of property in the tooth has arisen. The dentist, observing something fantastic about the fang, proposed to keep the tooth as a curiosity. His patient, on the other hand, claimed that this interesting tooth was his tooth, fruit of his own gum tree, and, though removed from its former sphere of usefulness, still his property. The contention of the dentist is that, having jerked the tooth out of the patient's jaw, title by descent is given, and the tooth being actually in his, the dentist's possession, may be held by him and defended against all comers. I know nothing of German law ; but, judging by analogy, it looks to me as if the dentist will prevail. An extracted tooth, I take it, like the untamed rook, hawk, polecat, or badger, belongs to the order of things *feræ naturæ*, and, therefore, cannot be the subject of larceny. Equally clear does it seem to be that there can be no wrongful conversion of a molar removed by consent, and, if so, the unhappy patient will not only lose his tooth, but lose his case also.

Reports of Societies.

NATIONAL DENTAL HOSPITAL STUDENTS' SOCIETY.

The last meeting of this Society was held on Friday, June 1st, at 8 o'clock. C. W. Glassington, Esq., President, in the chair.

The minutes of the previous meeting were read and confirmed, and the following gentlemen were elected as members of the Society :—Messrs. Etheridge, Moore, T. G. Rea, and A. E. Relph.

CASUAL COMMUNICATIONS.

Mr. HARRY ROSE showed by means of some well prepared diagrams how he treated Prognathous teeth of the upper jaw.

The first case was one in which the first bicuspids had been extracted, and a plate was made capping the back teeth, on each side of which a hard piece of German silver wire was attached, pressure being brought on the protruding incisors by means of these wires.

In the second case instead of using wire, a piece of Dental Alloy was struck up so as to fit on the tips and anterior surfaces of the two central incisors, and elastic bands attached from each side of the cap to the wings on the plate.

Another case was that in which the six year old molars had been extracted, so that the twelve year old molars were the only means of obtaining a leverage from which to draw back the anterior teeth. These twelve year old molars, Mr. Rose thought did not afford sufficient strength from which to obtain leverage, so the plan adopted in such a case was to do without a plate, and strike a piece of metal over the front surface and tips of the incisors, to which he attached good stout wires, coming outside the cheek at the angles of the mouth; then to these was attached an elastic bandage tied above and at the back of the head, so that by this means pressure was brought to bear upon the anterior teeth. This plan Mr. Rose thought was a very good one, providing the patient would submit to it. In the case he had just treated, it took ten weeks to complete.

Mr. Rose also showed a model of two irregular upper centrals occupying such a position, that the mesial surfaces were looking forward instead of laterally, and in which case he thought it was the best treatment to extract.

Mr. CLARK cited a case of anterior protrusion which had taken four months to regulate, and in which he thought the pulps of the centrals had died as the teeth had gone quite a different colour to the others; but to his great surprise when he last saw the case the teeth had improved in colour, and he hoped they would continue to do so. He thought that such a thing as this might be brought about by bringing too much pressure on the teeth. To this Mr. Rose suggested that the pressure should be constant and not intermittent. Mr. Clark also showed a tooth with a cavity in a very unusual position.

Mr. SPOKES brought forward a case of cleft palate (congenital), the patient being a girl of fifteen years. It had been decided not to operate as there was not sufficient tissue to ensure a good result, so a plate was made of the Kingsley type, consisting of two Vela Flaps, one above and one below the soft palate, attached to an ordinary vulcanite plate fitted to the hard palate. The patient showed how much better she could articulate with the plate in than without, and though it had only been worn for a few days, the difference of articulation was quite apparent.

The President then called upon Mr. Harry Rose for his paper on "Mineral Inlays," which we publish on page 687.

The paper was received with great applause, and a discussion arose in which the President, Messrs. Carter, Clarke and Reeve took part.

The President thanked Mr. Rose for his instructive paper, and a hearty vote of thanks was rendered accordingly. The meeting then adjourned until October 12th.

At the close of the meeting the President on behalf of the Students of the Hospital presented Mr. Burroughs with a handsome sovereign purse, as a small token of their esteem for him as House Surgeon, from which post he has just retired.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the "British Journal of Dental Science."

Sir,—Having been a subscriber and reader of your Journal for the last 25 years I ask for a short space, to say a few words in reference to a letter by "Enquirer" published in a recent issue.

I have in my possession a letter from the Medical Council, dated Nov. 1892, in which it is stated that "registration on the sole ground of being in practice before 1878 has *long since* entirely ceased." How, therefore, does "Enquirer" think it can be possible for us to believe that right up to, and now after the date of this letter from the Medical Council, which, it must be remembered states, "long since ceased," persons have been registered with no qualification whatever.

Yours truly,

J. D. GOY.

To the Editor of "The British Journal of Dental Science."

Sir,—I have the honour to communicate the following, hoping that it will interest your readers.

At its coming summer meeting on the 13th and 14th August, The Dental Society in Copenhagen has put on the programme, as the main subject for discussion, *the "School Children's Teeth" question* opened by Dr. George Cunningham, (Cambridge), who after a special invitation will attend the meeting.

On this occasion there also will be held a combined international conference about *Dental Education and Instruction.*

For the T. G. K.,
Yours very respectfully,
V. HADERUP, M.D.

Copenhagen, July 20, 1894.

⁂ From private letters, we are further assured that all members of recognised dental societies in this country will be heartily welcomed as visitors at what promises to be a most interesting meeting.—Ed.

ANSWERS TO CORRESPONDENTS.

Registered, but Non-Advertising Dentist.—Your letter reflects too much discredit on the diploma of a Royal College of Surgeons and without proofs that such assertions are correct, we hesitate to insert The rest might be published in a re-written letter.

Enquirer.—May we condense your letter, or will you kindly do so ?

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications : name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only ; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
6. The Journal will be supplied direct from the office on PREPAYMENT of subscription as under :

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British Journal of Dental Science.

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VULCANITE WORK.

By Harry Rose, L.D.S. Eng.,
Lecturer on Dental Mechanics, National Dental College.

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Vulcanite, or hard rubber, is a combination of caoutchouc, sulphur, and a colouring matter such as vermilion, to disguise and render more agreeable the colour of the native gum.

The remarkable effect of sulphur in combination with India rubber was discovered by Charles Goodyear, about the year 1840. In certain proportions and at certain temperatures the sulphur does not impair the flexibility of the native gum, but preserves it at low temperatures.

Hard rubber was afterwards discovered, and its use was devoted to the manufacturing of combs, buttons, etc., several years before its application to dental purposes. This was first attempted in 1853. It seems to have made but slow progress for it could not be said to be in general use until about 1868, when its claims to recognition became so strong that it completely superseded as a base plate, those formerly made of the tusks of the Hippopotamus, Walrus, and Wild Boar. It has, no doubt, been of immense service to the general public, enabling thousands to realise the benefits of the art, where formerly it was restricted to the few.

The introduction of this substance, and the comparative ease with which it could be manipulated, acted in another respect somewhat disastrously for the dental profession, introducing into their midst hundreds of unqualified, I should rather say untrained men, who but for this material would never have been able to earn a living by calling themselves dentists. This incursion of uneducated men into the profession, has also had a great effect on the quality of the work, for men who are content to work for a mere living wage, are not likely to develop æsthetic tastes, or raise their patients to a full appreciation of true art.

Hard rubber has now stood the best of all tests, viz., that of time, and the different makers have vied with each other in perfecting it both in colour and strength. It still maintains its position as the one material whereby an accurate and perfect representation of the dental arches can be obtained, and it is also the sole plastic material that remains unaffected by the secretions of the oral cavity, being at the same time strong, durable and clean.

Having then such a reliable material at our command, it should naturally prompt us as dentists to display our utmost skill, and to raise our productions to the highest possiblelevel.

In order to ensure perfect accuracy of fit in a hard rubber plate, it is absolutely necessary that it be vulcanized on the original model of the mouth, for if we depart from the original by taking another cast from it to vulcanize on, we are more likely to get an imperfect fit, instead of a perfect one.

As any increase in the thickness of a vulcanite, or in fact any plate, is detrimental to clearness of articulation, it becomes a matter of extreme importance to reduce the thickness so as to fill up the mouth as little as possible, but at the same time not to make any decrease in the strength of the plate.

Having that object in view, one is naturally led to consider how such a combination as strength and lightness can be brought about.

One finds by experience that a plate of an even thickness combines these two essentials, but to produce a thin vulcanite plate, copying the markings of the palate, and to preserve it from damage during the subsequent filing up and polishing, it is necessary to bring the surface of the palate out after it has undergone the process of vulcanization, with such a finish, that it will require no further filing or scraping, but only a slight rubbing with a brush at the lathe to complete it.

Vulcanizing the rubber consists in subjecting it to a temperature of 315 Fahr. for one hour and a quarter, in a suitable gun metal or copper boiler called a vulcanizer, especially prepared for this purpose. This treatment hardens the rubber, and allows of its being filed up like a piece of bone or ivory, and also of acquiring a high polish.

It will be my object in the following pages to explain how hard rubber plates can be produced of an even thickness, and yet have the elements of thinness, lightness, and strength.

Having the plaster models of the mouth articulated in a bite frame, we may adopt one of the following methods for making the matrix plate to mount the teeth on.

1st. A wax plate of the required thickness accurately moulded to the model.

2nd. A thick tin, lead, or meter metal, plate struck or swaged upon a zinc cast.

3rd. A sheet or sheets of meter metal blown into shape by means of the steam swager.

4th. A rubber plate fastened to the model by a solution of rubber in chloroform.

5th. A cooked vulcanite plate.

6th. A plate produced by means of a section separating a flask the required width.

The material used for the first named plate is a combination of bees wax and pure paraffin, in the proportion of two of the former to one of the latter, with a little carmine added to give it a pink colour. The carmine is first incorporated with a small portion of the melted wax so as to ensure its being intimately blended, after which it should be poured into the rest of the wax and paraffin and well stirred. The mixture should then be poured into a damp plaster mould, or on to a greased plate, to form it into thin cakes. It may then be re-softened in warm water and rolled into sheets of the proper thickness with a wet glass roller on a glass slab.

The plate is made by softening a sheet of the wax, by passing it to and fro over the flame of a spirit lamp, or Bunsen burner, taking care that the surface of the wax is not melted. One must now cut from the sheet with a pen-knife or pair of scissors, a piece sufficiently large for the case, which is then softened and accurately moulded to the palate, and alveolar ridges of model, beginning at the deep portion of palate first.

It is very essential that the wax be kept of an even thickness and the surface perfectly clean, smooth and free from blemish during the subsequent mounting of the teeth. By holding the wax plate against the light, one can readily perceive if any thinning has taken place, the light penetrating more through the thin part.

When the wax plate has been moulded and trimmed to the proper size, it should be tacked to the model by means of a warm instrument passed round the edges, thus melting them and thereby fixing. This prevents the slipping of the wax plate, keeping it secure while the teeth are being mounted. A modification of this method of making a wax plate, and which in some cases is very valuable, is by first fitting the teeth to the alveolar ridge, tacking them in place with wax, then adding wax to build up the front gum after which a piece of sheet wax of suitable size and thickness is moulded to the palate. The wax plate therefore, in this case has not to suffer the wear and tear of adjusting the teeth.

No. 2 matrix plate possesses certain valuable qualities not found in the former. In the first place it can be made, if necessary, of extreme thinness ; secondly, there is no danger of injuring its surface during the mounting of teeth ; thirdly, it has the still further advantage of enabling one to try it in the mouth after the teeth are mounted without the risk of its being bent out of shape or softened by the warmth of the oral cavity.

To produce this matrix plate one must take the plaster model and cast it in sand and obtain a zinc model, or die, and a lead counter, the same as for swaging up a gold plate. Having moulded a piece of lead foil to the zinc model,(on no account should the plaster model be used for this purpose), a corresponding piece of metal is cut out from a sheet of tin, lead, or meter metal, preferably the latter, because it is much stronger. This should be roughly adapted to the zinc model with a bone mallet, and then adjusted in the lead counter. The zinc model being placed in position, it should receive two or three blows with a heavy hammer or weight, and if satisfactory, the plate may be trimmed up according to the size required, and after seeing that it perfectly fits the model, can be used for mounting the teeth on. These having been mounted and fitted to the bite, the next operation is to obtain an impression in composition of the palate and backs of the teeth.

This can easily be done by softening and flattening out a small piece of composition, then lubricate the fingers with a little vaseline, and while the composition is still soft, press it so as to take an accurate impression, after dusting with French chalk, of the part that is required to be brought out polished.

Plaster of Paris can now be poured into this impression and a model made suitable for casting in sand the same as for the matrix plate.

A thin piece of tin or meter metal should now be struck or swaged up, and when completed is known as the polishing plate.

The matrix plate, therefore, of whatever substance it may be, represents the thickness of the contemplated rubber plate, and the polishing plate should fit accurately to it, and should cover the whole of the palate and slightly overlap the crowns of the molars and bicuspids. When adjusted, it should be fixed in position by slightly warming the edges of the plate at the back of the molars with a hot wax modeller—this fastens it to the wax, and is to prevent it slipping or rising from its place when the case is being inserted in the flask.

In order to make the next process clear for obtaining a matrix and polishing plate it will be advisable first of all to give a description of an apparatus invented by my colleague Mr. W. R. Humby for this purpose and called the Steam Swager.

THE STEAM SWAGER.

The Steam Swager is a hollow gun-metal chamber, the lower part of which will contain water, the upper dome-shaped portion being intended for the reception of a plaster representation of the shape of a plate, obtained by means of an A 1 or other composition impression.

When in action the upper part is shut off from the lower by a sheet of meter metal, which forms a diaphragm between the two. There is a hole drilled through the side of the dome near its upper border. This hole is of the greatest importance in allowing air, and also the steam that is generated from the damp plaster to escape, instead of being compressed between the meter metal plate (as it is being forced upwards), and the top of the dome or the surface of a model if present.

This hole should be on a higher level than the deepest portion of the model, and should have a groove leading to it from that part. Great care should be taken to ascertain that there is a free communication from the surface of the model with the external air.

Should this precaution be omitted and no exit allowed for compressed air, etc., when the steam pressure is removed the plate instead of being on the surface of the model will be inverted, or in other words turned inside out by the sudden expansion and consequent reversal of the pressure, being then, of course, useless.

Having obtained an impression in composition of the model or surface we require to polish, we mix up a small quantity of plaster of Paris, pouring some into the impression and some into the dome of the swager, having previously taken the precaution to place a piece of thick twine through the hole in the upper part. We now turn the impression over on the soft plaster in the dome just the same as if casting a model on the bench, and when the plaster has set, hot water is poured on to the composition in order to soften and remove it, after which the twine is withdrawn through the plaster.

We now have a plaster cast of the plate required with the requisite perforation for communication with the external air, and must trim off any sharp edges from our cast in order to prevent tearing of the metal before it is forced quite home on the model.

The lower chamber of the swager is half filled with water, and a suitable piece of meter metal cut out, also a corresponding piece of brown paper to act as a washer and form an air-tight joint to prevent escape of steam during the swaging process.

The sheet of meter metal and washer having been placed in position, the dome is fixed on the lower part by means of the adjustable arm, and screwed firmly into its place.

Heat is now applied by means of a Bunsen burner, and as the pressure of steam increases, so the meter metal diaphragm is forced upwards and made to copy the surface of the model or cast in the dome, steam, from the damp plaster, and air escaping through the perforation in top of the dome until the process is completed.

The pressure required for a polishing plate is about sixty pounds, that for a matrix plate about eighty, indicated by the gauge fixed to the lower or steam chamber.

When this point is reached, the gas should be turned out, and when the pressure has sunk to about thirty pounds, the screw that holds the dome in place may be gently loosened, and the remainder of steam allowed to escape.

The dome is now removed, and the plate withdrawn and trimmed to size with a pair of strong scissors ; it is then ready if a matrix plate, to fix to the model as the one last named, to mount the teeth on. The matrix plate realizes in its results the very perfection of what is known as a contour plate. This method of blowing up, according to thickness of the matrix plate required, of one, two, or three sheets of meter metal, on to a duplicate model cast in the swager, the model being obtained by means of an impression taken from the original in A 1 or other composition, is one to which I attach the greatest importance.

By using the Swager for this purpose the trouble and time lost in obtaining a zinc die and lead counter is saved, and the result obtained is so superior to that done by stamping up in metal dies that the two operations will not admit of any comparison.

In taking the impression of the original plaster model it is first of all necessary to dust it with French chalk or Lycopodium, then soften a portion of composition, and after kneading to free it from lumps, press it into the palate and then over the alveolar borders as far as required. If the fingers are lubricated with a little vaseline, the composition will not adhere to them, and when hard the impression is removed.

If there are natural teeth standing on the model, it will be sufficient to take an impression of as much of the model as we intend to cover with the rubber plate, and not bringing it up the teeth, in this way it can be readily removed from the model without injury.

On the other hand should the model, through some undercut, present a difficulty in the way of obtaining an impression in one piece, it can be overcome by taking it in sections.

Thus the impression of the palate can be taken first, removed when hard, and the edge bevelled off—then replaced on the model, and after being dusted with French chalk, soft composition to take the undercut is pressed into its place.

The two pieces of composition can now be readily removed and fixed together with hard wax to cast in the dome of swager; which is done in a similar manner to that previously described. The meter metal plate or plates are now adjusted to the lower part and the swager closed.

The pressure required for this part of the process is about eighty, or if more than one thickness of metal is used, a hundred lbs., which will be sufficient in most cases to produce a result such as could only be obtained by electrotyping, the plate not buckling nor in any way bearing the evidences incidental to stamping up in the ordinary way.

By means of a matrix and polishing plate produced in this way by the steam swager, one can obtain a perfect reproduction of the roof of the mouth, and the vulcanite plate made to represent a setting for the teeth copies the surface of the gums, both on its inferior as well as superior aspect, and the rugæ are accurately reproduced.

The advantages of such a plate are obvious; it takes up the smallest amount of room in the mouth, at the same time presenting to the tongue a surface such as it has been accustomed to.

Both articulation and mastication are thereby improved, and the patient becomes used to the case in much less time than he otherwise would.

No. 4 on our list is a matrix plate made by coating the plaster model with a sheet of rubber. To effect this it is necessary first of all to dry the plaster model, and while still warm to paint over its surface a solution of rubber in chloroform ; the warmth of the plaster causes a rapid evaporation of the chloroform, leaving a coating of rubber on the model; this should not extend further than the plate is required to cover, because it renders the trimming up of the soft rubber a difficult operation.

A pattern having been previously obtained, a piece of sheet rubber of the required size is now cut out, and after warming over a spirit lamp or on a hot plate, is pressed first of all into the concavity of the palate. The object of pressing the rubber into the deep portion of the palate first, will be apparent at once when I mention that wherever the rubber plate comes in contact with the film of rubber on the model, there it firmly adheres ; for example, were it to attach itself to the alveolar borders first, it would be found impossible to force it into the palate afterwards.

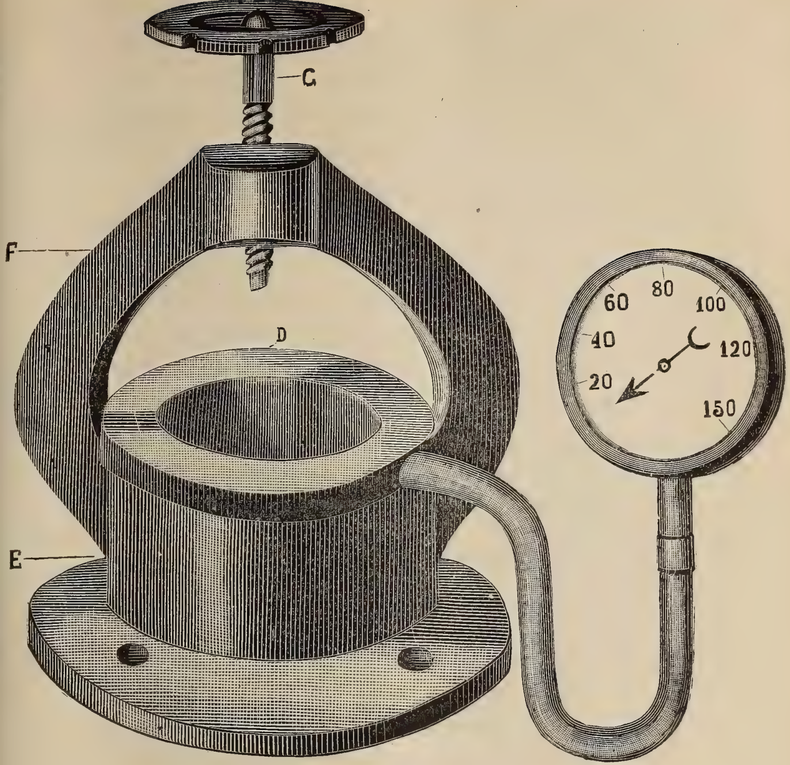
When the rubber plate has been carefully worked between and around the teeth, and any excess trimmed off with a warm knife, it is ready to mount the teeth on.

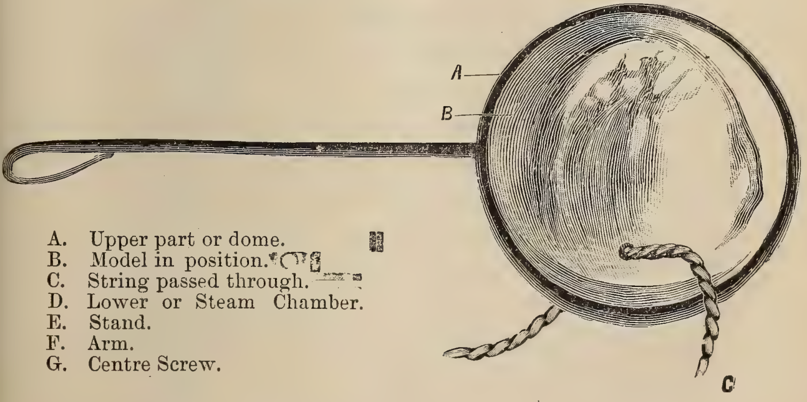
The advantages of a rubber plate such as I have described are :—

1st. That the palate requires no further packing.

2nd. That the plate is of an even thickness and copies to some extent the roof of the mouth, and

3rd. That the teeth may be, if desired, fitted and fixed to





A. Upper part or dome.
B. Model in position.
C. String passed through.
D. Lower or Steam Chamber.
E. Stand.
F. Arm.
G. Centre Screw.

the rubber plate by means of small pieces of soft rubber, instead of attaching them to the plate with wax in the ordinary way.

If the rubber is kept warm and small pieces are used the packing of a case under these conditions is not a difficult undertaking.

Thus the case can be packed on the model, and when the surface of the rubber has been smoothed by rubbing it with a pledget of wool or a stiff camel-hair pencil moistened with chloroform, and a polishing plate fixed to it, nothing more is required than to immerse it in plaster in a flask and it is ready for the vulcanizer. If it is not desired to do all the packing on the model, the teeth may be fixed to the rubber plate with wax, and then after inserting the case in the flask in the ordinary manner and washing out the wax with boiling water, the packing may be completed.

(To be continued.)

An Alloy which Adheres to Glass.—M. F. Walter has found that an alloy consisting of ninety-five parts of tin and five parts of copper adheres so tenaciously to glass that it may be employed as a solder to join the ends of glass tubes. It is obtained by adding the copper to the tin previously melted, agitating with a wooden stirrer, casting or granulating, and then remelting. It melts at about 360° C. By adding from one-half to one per cent. of lead or zinc the alloy may be rendered either softer or harder, or more or less easily fusible. It may also be used for silvering metals or metallic thread.

(*Rev. Scientifipue*)—*B. and C. Druggist*

ON THE COMPARATIVE EFFECTS OF GAS, GAS AND OXYGEN, AND GAS AND AIR, IN THE SAME PATIENTS.*

By GEORGE ROWELL, F.R.C.S.

Mr. President and Gentlemen,—The cases which are recorded on the charts before you are, I think, of some interest as showing the relative results of nitrous oxide gas, gas and oxygen, and gas and air in the same patients. Different patients vary so much under anæsthetics that in order to institute a true comparison between various anæsthetic agents it is very desirable to use the same subject. These cases form part of a series of observations which I began in the Dental Hospital of London, with this object in view, but which, unfortunately, I have not had the time to carry on to such numbers as would give the totals a statistical value. But because these cases are fairly typical, so far as my experience goes, of the different behaviour of most types of patients under these three anæsthetics, I have ventured to submit them to this Society.

In the gas administrations the apparatus was provided with an inspiratory valve; special care was taken to exclude all air, and the inhalation was continued to a point somewhat more advanced than usual, in order to obtain the fullest effects of the gas consistent with safety and the convenience of the operator. This was done for purposes of comparison. The gas and oxygen was given by Dr. Hewitt's method, with the apparatus which he described before this Society in June, 1892.

The method of giving the gas and air was that which I described at the Manchester meeting of the British Dental Association in 1892. Briefly it is as follows. Taking every precaution to eliminate all air from the gas and from the apparatus, pure gas is administered with any apparatus possessing an inspiratory valve, for from 10 to 18 breaths, until the stage in which excitement is producible has passed, or almost passed. Then a single inspiration of air is given. This is followed by 5, 6, or 7 breaths of pure gas, when another breath of air is given, also followed by 5 or 6 breaths of gas. One sometimes proceeds in this manner until either the commencement of what is known as "nitrous oxide stertor," or of slight twitchings, or—and this more frequently—until the breathing begins to become irregular, without either stertor or jactitation. But, on the other hand, it is often found that after some 80 or 90 seconds none of these symptoms have made their appearance, and the face-piece is removed, as one knows that after so long an administration a good anæsthesia will result. The number of breaths of air to give, and the periods at which to administer them, depend upon experience, and the state of the patient. With noise, movement, active conjunctival reflex, and evidence of only a light degree of anæsthesia, air is withheld; and, similarly, with commencing cyanosis, absent conjunctival reflex, and snoring, air may be given with a freedom which is surprising to those who have looked upon absence of all air as a first essential to successful gas administrations. This method is the one I believe to be the best for giving gas and air. In point of fact it seems not so much to be a matter of consequence how and when the air is administered; to have the gas free from air at first, and not to administer the first breath of air too soon, are the all-important necessities.

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* Read before the Odontological Society of Great Britain.

In taking these cases I adopted the method practised by Dr. Hewitt, which the Society will remember.

The three patients whose cases are here given had very bad teeth. Beyond this, Case I. was in fair health. She took gas and air first. The air was given rather earlier than usual because her breathing was deep, and twice it was followed by slight phonation. This being so, she was allowed more gas than usual, until slight stertor began, which was controlled by another breath of air. She had only slight signs of deprivation of oxygen at the end of 85 sec., and had a good anæsthesia of 42 secs., after the removal of the face-piece. With pure gas, phonation occurred at 30 secs., otherwise the administration was typical, but she only had 22 secs. anæthesia. With gas and oxygen the phonation still occurred, but soon ceased, and a typical anæsthesia resulted of about 37 sec.

There was only 24 hours' interval between the administrations, which might tend to render the two last less satisfactory than the first.

Case II. was in a very bad condition. She was extremely anæmic, and was suffering from headache, neuralgia, dyspepsia, and breathlessness. The gas administration was the first, and it was pushed as far as one felt able to push it. The operator was just about to begin the second tooth when she was able to open her eyes—28 secs. anæsthesia. After a fortnight she took gas and oxygen and 35 secs. anæsthesia was obtained, of the usual satisfactory character, strongly contrasting, in such a patient, with that obtained from pure gas. The gas and air administration, a week later, resulted in less asphyxial phenomena than with gas alone, and the anæsthesia was 35 secs., although "slight phonation" is noted at 30 secs. With regard to after effects, it is worthy of note that the headache was distinctly said to be less after the gas and oxygen.

Case III. was a strong type of girl, who showed great signs of nervousness on each occasion, which, however, gave no trouble after the administration had once commenced. She had a typical gas administration, except that snoring developed early, and 38 sec. anæsthesia followed as against 53 sec. with gas and air and 50 secs. with gas and oxygen.

The exhilaration after gas contrasts with the dazed condition after gas and air. The gas and air administration was this time shorter than the gas and oxygen, and the snoring was later in appearing than with gas alone.

With gas and oxygen the snoring did not appear at all, but at 55 secs. the "distant stertor" described by Dr. Hewitt occurred, and no doubt lasted till the end of the administration, although there is no note of this. I think there was certainly 50 sec. anæsthesia; it was quite a second after "50" was called by the timekeeper that the cry occurred, and then very little pain was felt.

Let me beg to call your attention to the symptoms at the height of anæsthesia from each of these anæsthetics. With pure gas there are the usual asphyxial symptoms—undistinguishable, Dr. Hewitt tells us, from the symptoms produced by the inhalation of nitrogen. With gas and oxygen the symptoms that Dr. Hewitt has described to the Society were seen. The condition is best described as "sleeplike." Gas and air holds an intermediary position. The asphyxial phenomena are only slightly developed, and, indeed, a slight degree of cyanosis is often all. The relative merits of gas and gas and oxygen are well known to you. For gas and air I would venture to claim the great advantage of a long anæsthesia. I believe, after trying the method some 2000 times, that on the whole the anæsthesia is longer even than that obtainable with gas and oxygen. It requires no special apparatus, and what may be considered the typical state (very slight asphyxial manifestations, and a long and quiet anæsthesia) is not difficult of attainment.

The disadvantages of gas and air are that noise and movement are perhaps more likely to occur than with gas alone.

If, however, the gas has been given pure for the first part of the inhalation this disadvantage scarcely exists.

I cannot attempt to place details of comparison between these three methods before the Society without more statistics than I have at my disposal. But perhaps I may be allowed to indicate broadly the differences that I feel sure anyone who has tried the three methods will have observed.

	Gas.	Gas and Air.	Gas and Oxygen
Stertor & jactitation	Necessary.	Not necessary for success.	Absent.
Cyanosis	Marked.	Much less.	Absent.
Pupils	Largest.	Intermediary.	Smallest.
Average Anæsthesia	Say 30 sec.	Longest.	44 sec. (Hewitt.)

It would seem, then, that air given with gas, by prolonging the inhalation, enabled more gas to be absorbed, and the blood to become more uniformly charged with nitrous oxide, and hence is the explanation of the longer period of anæsthesia which results.

Oxygen given with gas does this also, and in a better way, practically abolishing all asphyxial symptoms.

Perhaps I may venture to say that, personally, I use gas and oxygen in preference to either gas and air or gas alone.

But where gas and oxygen is not to hand, I am convinced that a little air, towards the close of the administration, will be found, in nearly all cases, to give more satisfactory results than can be obtained by using pure nitrous oxide.

Case I.—A. E., age 29, servant, fair health, high colour.

Secs.	February 20, 1893. (1) Gas and Air.	Secs.	February 21, 1893. (2) Gas.	Secs.	February 22, 1893. (3) Gas and Oxygen.
	Deep breathing,	10	5 regular breaths		Oxygen, 3 holes.
30	12 breaths N_2O. 1 Inspiration Air.	20	10 „ „	10	4 breaths, 4 „
		30	Slight phonation	15	3 „ 5 „
35	Slight phonation.	35	Noise ceased.		2 „ 6 „
40	Breath held for 3 or 4 secs., then R. regular.	40	No lid reflex.	26	2 „ 7 „
		45	Stertor, irregular breathing, jactitation.	30	2 „ 8 „ (slight phonation).
50	5 breaths N_2O. 1 Inspiration Air. Slight noise, then quiet.			40	9 holes (quiet breathing.)
		50	Face-piece removed.		
70	11 breaths N_2O. Slight stertor. 1 Inspiration Air.			60	10 holes.
				85	No lid reflex, tranquil R.
75	Stertor ceased.			90	Face-piece removed.
85	5 quiet breaths N_2O. R. becoming irregular, face-piece removed.				
	Quite quiet, slightly blue. Pupils 4 mm.		Clonus. Deep cyanosis, irregular stertor.		Sleeplike. Good colour, quiet breathing.

Periods of Anæsthesia.

5	3 deep breaths.	8	Regular breathing.	20	Continues quiet.
20	No R. for last 8 or 10 secs.			30	Legs moved a little.
22	5 hurried R.'s, then R. regular to end.	10	No lid reflex.		
		15	No movement, but slight phonation to end.	35	Operation over (4 stumps), conscious about 37 secs.
35	Slight phonation.				
42	Operation over. Still unconscious.				
		22	Operation stopped (3 stumps) conscious at once.		

No pain or dream with either.

CASE II.—M. T., servant, 20, bad health, much anæmia, neuralgia.

Secs.	February 1, 1893. 1) Gas.	Secs.	February 15, 1893. (2) Gas and Oxygen.	Secs.	February 22, 1893. (3) Gas and Air.
	R. quick, regular.		Oxygen, 3 holes.	10	6 breaths N_2O.
		5	3 breaths, 5 "	25	13 " " 1 BREATH AIR.
20	12 breaths.	10	3 " 6 "		
35	20 "	20	7 "	35	6 " " 1 BREATH AIR.
40	Lid reflex present. Stertor and irregular breathing, 2 more breaths, clonus.	25	7 " 9 "		
		35	R. quiet. 10 "	40	R. regular, getting longer.
		45	11 "	50	5 breaths N_2O. 1 BREATH AIR. R. quicker.
		50	R. stopped for few seconds.	60	8 breaths N_2O. 1 BREATH AIR.
		55	Very quiet breathing.	70	R. a little irregular.
45	Inhalation ceased.	65	Face-piece removed.	75	Slight twitchings. Inhalations ceased.
	Deep cyanosis and clonus. Pupils widely dilated.		Good colour. Pupils 4½ mm., no lid reflex. Quiet.		No stertor. Pupils 5 mm., rather cyanosed.

PERIODS OF ANÆSTHESIA.

	Slipped down a little in chair.	20	Lid reflex present. Pupils 5½ mm.	15	Quite quiet.
5	Jactitation ceased.	30	Perfectly quiet.	30	Slight phonation.
15	Quiet.	35	Operation over (3 stumps). A few seconds after gave a sudden cry and became conscious; cried afterwards.	35	Operation over, cried afterwards.
28	Tooth out. Could open eyes when requested. Slight moaning for a few seconds after.				

No pain with either. Headache after each administration, not so bad after (2).

Case III.—E. F. H., nursemaid, 21, plump, and strong, very nervous.

Secs.	February 2, 1893. (1) Gas.	Secs.	February 9, 1893. (2) Gas and Air.	Secs.	February 15, 1893. (3) Gas and Oxygen.
10	R. quiet.	10	Moaning.		Oxygen, 3 holes.
20	8 breaths, slight phonation.	24	11 breaths N_2O, quiet. 1 Breath Air.	15	7 breaths, 5 "
				20	4 " 6 "
32	15 breaths, slight stertor to end.	35	6 breaths N_2O. 1 Breath Air.	25	2 " 7 "
				30	2 " 8 "
45	No lid reflex. Slight clonus of arms.	40	Slight stertor to end.	35	3 " 9 "
		45	5 breaths N_2O. 1 Breath Air.	45	4 " 10 "
				52	3 " 12 "
50	Jerky stertor. Pupils wide.	55	5 " " 1 Breath Air.	55	Slight "distant stertor."
55	Face-piece removed.	82	12 breaths N_2O. Slight lateral rigidity of neck. R. becoming irregular, face-piece removed.	60	No lid reflex. Pupils 1½ mm.
				70	Still very slight stertor. R. regular, shallow.
				85	Inhalation ceased.
	Deeply cyanosed. Clonus.		Rather blue, no clonus.		Good colour. Quiet. Pupils 1½ mm.

Periods of Anæsthesia.

	Jactitation rapidly disappeared. After 2 breaths R. quiet.	5	Slight movement of arms, which ceased.	25	Very quiet; pupils still 1½ mm. Slight lid reflex.
		10	R. very quiet.		
		30	Slight phonation, no lid reflex.	51	Sudden slight cry, operation stopped (2 teeth). Says she "thinks she felt it."
25	No movement.	50	Something being done till this point. Quiet Quite unconscious.		
30	Slight inspiratory noise.				
38	End of Anæsthesia (2 molars).	53	Can open eyes.		
	No pain. Ludicrous dream. Exhilarated afterwards.		No pain—no dream. Dazed afterwards. Headache afterwards.		? pain. Say 50 secs. anæsthesia. No dream.

GENERAL PATHOLOGY AND SURGERY FOR DENTISTS.

By EDMUND W. ROUGHTON, M.D., B.S. (Lond.), F.R.C.S. (Eng.)

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BACTERIA IN RELATION TO DISEASE.

Bacteria are minute specks of vegetable protoplasm. They are widely distributed in nature, being found practically everywhere, except in the middle of the ocean, at very high altitudes, and deep in the earth. They form a considerable portion of the dust which can be seen floating in the air in bright sunlight, and which deposits itself everywhere, especially in large towns. These minute organisms in their proper places perform useful functions, such as the convertion of starch into sugar, of sugar into alcohol, of alcohol into vinegar, &c. ; processes which are essential in various commercial operations. They also perform the function of general scavengers. Were it not for their almost universal presence, dead animal and vegetable matter would remain practically unchanged for indefinite periods, but by their agency dead organic matter undergoes decomposition whereby complicated organic chemical compounds are split up into simpler inorganic compounds which serve as nourishment for vegetable life.

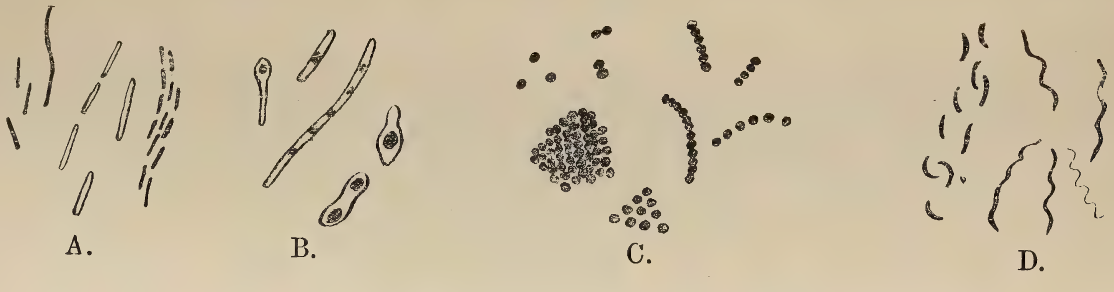
Unfortunately for humanity at large, (perhaps fortunately for the practitioner of dentistry) these organisms sometimes exceed their duty and attempt, too often with success, the decomposition of portions of our body which we would rather retain intact. Decay of teeth is nothing more or less than decomposition or devouring of dental tissues by different sorts of bacteria. It is essential therefore that the student of dentistry should be familiar with these organisms, which in a sense may be termed the authors of his existence. The following are some of the most important forms met with.

Bacilli are minute rod-shaped organisms averaging about $\frac{1}{6000}$ inch long and $\frac{1}{25000}$ inch broad. It is only with the highest powers of the microscope that their structure and characters can be accurately observed. They consist of a very thin wall containing living proto-plasm (myco-protein). They grow in two ways, either by fission, i.e., one bacillus divides into two, or by the formation of spores or seed-like bodies. (Fig. 4, *a* and *b*.)

Micrococci are minute spherical cells, about $\frac{1}{25000}$ inch in diameter, having the same structure as bacilli, but only multiplying by fission. They are often grouped in pairs (diplococci), or in clusters (staphylococci), or in chains (streptococci). (Fig. 4 *c*.)

Spirilla or *vibrios* are twisted screw-shape organisms. (Fig. 4 *d*.) They multiply by fission.

Certain conditions influence the growth and development of bacteria. Most of them grow readily at the temperature of the body, 37° C. Some of them will grow at temperatures as low as 20° C. Growth is almost or completely stopped by temperatures above 40° C. or below 5° C. All bacteria are killed by boiling, but their spores will stand even this amount of heat, being extremely resistant and durable. Some bacteria (aërobic) will only grow when there is a sufficient supply of oxygen; others will not grow in the presence of oxygen (anaërobic); others again are indifferent to this gas, doing equally well with it or without it. Food is necessary for all living things. In the body bacteria live on such things as blood, serum, lymph, saliva, débris of food in the mouth, etc. In the laboratory artificial culture media are used as food materials. They consist mostly of peptonised beef extract, either in the fluid state or solidified by the



DIFFERENT FORMS OF BACTERIA.

A.—Bacilli. B.—Spore bearing bacilli. C.—Micro-cocci, diplococci, streptococc and staphylococci. D.—Different forms of spirilla.

addition of gelatine or agar-agar. Moisture is essential for bacterial growth, most forms being killed by drying. Bacteria are also killed by certain chemical substances called *antiseptics.*

EFFECTS OF BACTERIA ON THE BODY.

Bacteria may effect an entrance into any part of the body either directly, by means of a wound or breach of continuity of surface, or indirectly, by means of the alimentary or respiratory tracts. According to the effects they produce they are divided into two important classes:—

(*a*) *Saprophytic*, *septic*, or *non-pathogenic* organisms can only live on dead tissue, consequently they are only found in the secretions of a wound, or on some mucous or cutaneous surface; if they should find their way into the circulation they very soon die, being incapable of splitting up living organic matter for purposes of their own nutrition. They are, however, capable of chemically decomposing dead organic matter such as serum, the result being that certain poisonous substances called *ptomaines* are formed, which act as irritants to the living tissues producing inflammation, and even suppuration if their action is sufficiently severe and prolonged. Sometimes, but by no means always, the process of fermentation, whereby the ptomaines are produced, is accompanied by the evolution of foul-smelling gases—*putrefaction.* The ptomaines may become absorbed into the blood, and, acting as poisons on the heat regulating apparatus, produce fever.

(*b*) *Parasitic*, *infective*, or *pathogenic* organisms, although able to live on dead organic matter like the saphophytes, are distinguished from the latter by their ability to decompose living organic material, and thus maintain an existence in the blood and tissues, producing grave alterations of nutrition, in as much as they appropriate to their own use various nutritive materials intended for the benefit of the tissues, and at the same time contaminate the blood with their poisonous secretions. A few pathogenic organisms such as the anthrax bacillus, seem to be able to flourish in the blood of a healthy animal, provided they have once been successfully inoculated, but the majority of them are only capable of successfully attacking the tissues when the vitality of the latter has been lowered by some local or constitutional predisposing cause, and this is because living blood has a certain power of destroying bacteria. It is at present uncertain how the bacteria are killed, but it seems pretty certain that leucocytes are capable of swallowing and digesting them (*phagocytosis*). If the vitality of the leucocyte (or phagocyte) is lowered, it is apt to find the bacterium too tough for its digestive powers, and itself dies like a soldier fighting for his country.

THE BACTERIA OF THE MOUTH.—The mouth forms an excellent incubator or warm chamber for the growth of bacteria ; its temperature is pretty constantly about 37° C., which is, as already stated, the optimum temperature for the growth of most organisms ; sufficient access of air is afforded for those germs which require oxygen or are indifferent to its presence. Food material for them is present in abundance; dead and cast-off epithelium affords nourishment for at least some germs, for it is not uncommon to find squamous epithelial cells covered and partly disintegrated by chains of bacteria. Particles of food remaining between the teeth after a meal are utilised by bacteria ; this may easily be proved by chewing up some bread and placing it in a stoppered test tube in the incubator ; after two or three days, examination under the microscope will show that many different sorts of bacilli and micrococci are present in abundance. Even such a hard substance as dentine is, when decalcified, readily devoured by many of the mouth bacteria. When we add to the above food materials the exposed pulps of teeth, buccal mucus, and inflammatory exudations from the gums, we shall see that there is no lack of nourishment for germs resident in the mouth. Wherever there is something worth having and nothing to pay for it, it is only natural to expect a crowd ; and so it is in the mouth, for here germs simply abound. Whenever we open our mouths to take in food, drink or air, we admit at the same time a great many micro-organisms of different sorts, and it is only reasonable to expect that they, finding such comfortable quarters, should settle down and propagate. These considerations might lead one to suppose that the human mouth would contain every single germ in existence ; and so it would were it not for "the struggle for existence" which is constantly going on everywhere, causing the stronger to prevail and the weaker to perish ; thus it is that although over a hundred different sorts have been discovered, the number of regular tenants of the mouth is very small, viz., about six. It seems that the conditions in the mouth exactly suit these few bacteria, enabling them to crowd out all others ; moreover, it is a strange fact that they absolutely refuse to grow outside the mouth on any of the artificial nutrient media of which we know.

If a small portion of the soft white matter, which collects upon the teeth, be spread out in an extremely thin layer upon a cover glass and stained with an anilin dye, such as gentian-violet, a specimen of great beauty and interest, from a bacteriological point of view, will be produced. If we examine it with a one-twelfth oil immersion lens we shall see swarms of micro-organisms of different sorts and sizes, some being rod or thread-shaped, some round or egg-shaped, and others spiral or screw-shaped.

(*a*) *The rod-shaped organisms.*—Of these there is a great variety, both with regard to length and breadth, some of them being jointed transversely and others jointless. The name leptothrix is commonly given to the jointless thread-like forms ; the name, however, is not a good one, as authors are not agreed amongst themselves what to include under it, and what to exclude. Most commonly leptothrix filaments appear as a jumbled-up heap, like an entangled piece of string ; sometimes the threads are much larger and wavy in outline, many threads being attached to a sort of common root of structureless material.

The jointed rod-shaped organisms (bacilli) also vary greatly in size ; notable amongst them on account of its dimensions is the bacillus buccalis maximus, which is found in long thick jointed rods about three to ten μ long, sometime singly, sometime in tufts. It is stained violet by iodine, whereas the leptothrix remains unaffected. Many other bacilli will usually be seen in different specimens and in different mouths; some of these will be referred to presently.

(*b*) *Spherical Organisms or Micrococci.*—The micrococci, although perhaps as numerous, are on account of their smaller size less conspicuous than the bacilli and threads. They are sometimes in clusters, sometimes in chains, or tetrads, or pairs, or scattered singly. The pairs, tetrads and chains, when short, are sometimes enclosed in a transparent glassy-looking capsule.

(*c*) *Spiral Organisms.*—The occurence in the mouth of curved organisms resembling a comma has long been recognised. Professor Lewis drew especial attention to them, and he and Klein at one time regarded them as identical with Koch's cholera bacillus, but subsequent investigation has shown that although much alike in morphological character, they differ in this marked respect, viz., that whereas the cholera vibrio grows readily on gelatine, the comma bacillus of the mouth (spirillum sputigenum) refuses to grow anywhere but in the mouth. In an ordinary clean and healthy mouth it is found in small numbers, but under the margins of slightly reddened and inflamed gums it is found in large numbers. When examined in its natural live state, it is seen to be highly motile; it is by means of flagella or whip-like processes that these motile organisms move about. The number and mode of attachment of the flagella varies a good deal; in some of them only one flagellum is to be seen, attached either to one end, or to the middle of either the concave or convex side of the comma, whilst in others a bunch of four or five flagella is not infrequently seen. They may exceed the length of the comma itself by several times; they cannot be seen in the unstained condition, nor indeed by the ordinary method of staining. They require to be treated with a mordant, and then stained after the method of Loeffler. Sometimes two or more comma bacilli may be seen in a row, end to end, forming a short spiral; this is due to incomplete fission.

Another spiral organism often found under inflamed gums is the spirochœte dentium. It occurs in the form of long wavy spirals of varying thickness and size of twists.

The organisms just described which occur in nearly every mouth, are nearly all of them non-pathogenic, *i.e.*, they are incapable of producing any morbid condition when injected into the blood or tissues of an animal. The fact that they are uncultivable has rendered it probable that they are also uncultivable pathogenic organisms inhabiting the mouth; indeed such organisms have been described by Kreibohm and by Miller. But passing these by, there are others which have been cultivated and very fully studied.

It has long been known (even to the ancients) that human saliva was poisonous. This toxic property has been, from time to time, attributed to various causes, but it was first shown by Raynaud and Lannelongue in 1881 that it was really due to the presence of micro-organisms. About the same time Pasteur discovered in the mouth of a child suffering from hydrophobia an encapsuled diplococcus resembling the figure 8. Saliva containing these germs, when injected into rabbits, produced a rapidly fatal result. This he considered to be the specific germ of hydrophobia, but Vulpian soon afterwards produced the same symptoms and fatal result by injecting healthy saliva, and the same capsule cocci were found in the blood of the dead animals. A. Fraenkel discovered the same organism in cases of croupous pneumonia, and others have since found it in peritonitis, pleurisy, meningitis, otitis media, and other inflammatory processes. In the causation of these various diseases it plays a most important part, if indeed it is not solely responsible for them. This important organism is now designated the micrococcus of sputum septicæmia. It occurs frequently in the mouths of healthy persons in the form of encapsuled diplococci, which are not always easy to find under the microscope, but whose presence may be demonstrated by injecting some of the saliva into mice. Out of one hundred and eleven mice killed in this way, Miller found the micrococci of sputum septicæmia in the blood and tissues in sixty-one. The saliva had been taken from a different person in each case.

This micrococcus will grow on culture media, but not readily. It requires a temperature somewhere between 24° and 42° C., and a faintly alkaline medium. The colonies resemble dewdrops in appearance. They will not live much longer than five or six days, after which time, if it is desired to further propagate the species, it must be done by passing it through the body of a susceptible animal, and from its blood inoculating fresh culture media.

Effects of Mouth Bacteria. — As already stated, dental caries is nothing more or less than the devouring of the teeth by the bacteria of the mouth ; the only conditions that the germs exact are that the dentine shall be exposed by removal of its enamel covering, and decalcified by acids.

We are not concerned at present with the numerous causes which bring about these conditions, but it should be clearly understood, that in the absence of bacteria, caries cannot occur. If properly prepared sections of decayed dentine be examined under a high power it will be found that the tubes are stuffed with bacteria of different sorts, in some places being bulged out into the so-called liquefaction foci. Some tubes are found to contain only micrococci, others bacilli only, others spiral organisms, while frequently the infection is "mixed." Sooner or later, if the decay is unchecked, the bacteria gain admission to the pulp cavity, setting up acute inflammation which may lead to gangrene of the pulp. From the pulp the bacteria may extend to the apical foramen, producing an alveolar abscess with its possible results, such as disfigurement of the face, necrosis of the jaw, spreading suppuration, and even sometimes septicæmia, pyæmia, and death.

The various inflammatory and catarrhal conditions and ulcers about the mouth are to a large extent due to the action of bacteria. Some local or constitutional condition diminishes the vital resistance of a part of the mucous membrane, and so permits of its invasion and destruction by bacteria.

After all large operations on the mouth one of the greatest dangers to be feared is some form of septicæmia, for by such proceedings we bring about conditions very favourable for the entrance of germs into the system—in fact, we imitate very closely the experimental injection of septic saliva into animals, the fatal results of which have been already alluded to. Perhaps at the time of the operation when we make our incisions, germs may enter directly into the circulatory system. The abundant oozing of serum from the large raw surfaces left by the operation affords additional culture medium for the growth of micro-organisms; the injury inflicted directly on the tissues diminishes their vitality, and thereby their power of resistance to septic infection, and the loss of blood (always serious in a large mouth operation) weakens the whole system and still further renders it a prey to the ravages of invading micro-organisms. Not only after large operations, but after the extraction of teeth and lancing of gums, fatal septicæmia has occurred. Not only may a dirty mouth serve as a source of infection for its owner, but also for other patients operated on with the same instruments imperfectly cleaned. It is well known that syphilis has been inoculated in this way, and, perhaps, other diseases too. It must also be remembered that there is risk to the operator as well as to the patient in the performance of an operation in an unclean mouth. Both local and general infection may follow injuries to the fingers by ragged teeth or dental instruments. Miller has recorded a case of chronic pyæmia in a dentist who injured his finger with a bur whilst cleaning out a decayed tooth. The result was suppuration in the wounded finger, the axilla, the lungs and elsewhere, no less than 135 abscesses forming in the course of two years. The pus contained the bacillus buccalis septicus, an organism frequently found in the mouth.

An unclean mouth, coupled with nasal obstruction and a weak state of the general health, are the conditions most fruitful in producing inflammatory conditions of the throat, and (by extension along the Eustachian tube) of the middle ear. The pneumococcus of Fraenkel and the pneumo-bacillus of Friedlander (both of them frequent residents in the mouth) have been found in otitis media and in cerebral abscesses consequent upon it.

Allusion has already been made to septicæmia following an operation upon the mouth. One of the commonest forms of it is septic pneumonia, produced by the inhalation of septic matter from the mouth. The fact that the pneumococcus of

Fraenkel and the micrococcus of sputum septicæmia are almost certainly one and the same, leads one to suppose that many cases of acute lobar pneumonia may be the result of direct infection from the mouth. At first sight this does not seem to harmonise with the well-known fact that pneumonia often follows directly upon exposure to cold winds, immersion in cold water, or some other form of "catching cold." But the depressing influence of cold simply diminishes the vital resistance of the lungs, and so places them at the mercy of any germs which may be inspired from the mouth or outside air.

When we swallow food or saliva we take into our stomachs hosts of germs, many of which are capable of setting up diverse forms of fermentation and so disordering digestion. This fact is sometimes lost sight of by physicians, some of whom treat dyspepsia without inquiring into the condition of the mouth and teeth.

The chief practical lesson to be learnt from a study of the bacteria of the mouth is that the greatest possible care should be taken to thoroughly cleanse all dental instruments *both before and after use.*

(*To be continued*).

FUSIBLE METAL.

Lead,	Tin.	Bismuth.		Melts at
1 part	1 part	1 part		250 deg.
1 ,,	1 ,,	2 ,,		200 ,,
10 ,,	16 ,,	8 ,,		300 ,,
16 ,,	14 ,,	8 ,,		280 ,,
1 ,,	1 ,,	2 ,,	add a little mercury	112 ,,

The formula of Watts' metal for cast plates is: Tin, 40 dwt.; Silver, 8 dwt.; Bismuth, 16 grains.—*J. E. Davis, Columbus.*

British Journal of Dental Science.

LONDON, AUG. 15th, 1894.

REFERRED PAIN.

DENTAL practitioners are all aware that some of the cases which require the most consideration, and demand an extremely careful diagnosis, are those in which the patient does not complain of a localised tooth-ache so much as of neuralgic pains which it is sometimes difficult at first to ascribe to any one particular tooth. In these instances of referred pain it is customary to imagine that the irritation conveyed to the brain by the nerve-fibres of the affected tooth is radiated to the central ends of adjoining fibres. Dentists have hitherto been obliged to content themselves by accepting certain more or less well defined positions as indicating a lesion in particular teeth, but, as stated above, cases occur which do not always coincide with such rules and which require close study. Any new light which can be thrown upon the subject is well worthy of attention, especially when it is the outcome of skilled observation conducted in a scientific manner.

Some twelve months ago Dr. HENRY HEAD published an elaborate paper in which he pointed out that disturbance of internal organs was accompanied by pain at certain points on the surface of the body, and that such points were frequently the centre of an area of superficial tenderness. Dr. HEAD has now supplemented his former work by a most interesting communication recently made to the Neurological Society. And, in endeavouring to map out the areas of tenderness and the foci of referred pain in the Head and Neck, the author had necessarily to include a consideration of the diseases of the teeth as well as of the eye, ear, and other organs. Amongst the areas, are some to which we wish to draw attention, inasmuch as these are said to stand in definite relationship to certain individual teeth.

The subject as presented by the author is doubtless a complex one, and requires a good deal of mental application to properly appreciate it, but we gather that the results of this new theory of localisation do not altogether fit in with the anatomical distributions of the Fifth Nerve. We understand that a suggested explanation of the facts is to be found in the embryological or developmental grouping and relationships of several parts of the body which, at later periods, do not seem to have so clear a connection with one another. Whatever the true reason may be, Dr. HEAD's conclusions, based upon the investigation of many cases, are deserving of the closest attention in order that they may be tested by those engaged in dental work, for the verdict may also be valuable to other specialists in surgery. A good illustration of this is afforded by two cases, noted by the author, in which pain in the ear, not due to ear disease, led the patients to consult aural surgeons. In the first, all pain and tenderness disappeared when the pulp of a carious second lower molar, on the same side, was destroyed by arsenic. In the other instance, the specialist perforated the drum without relief, which, however, was complete after the removal of a lower molar with an inflamed pulp. The position taken in the paper under notice, is that as long as the pulp is not involved the pain is local, and in periodontitis also the pain is not "referred." But with exposure of the pulp comes neuralgia, and then one of the areas mentioned will become more or less tender after some hours. "In testing the tenderness on the forehead or upper part of the cheek, the blunt head of a pin may be used, owing to the presence of a firm bony substructure. But on the lower part of the cheek or neck it is better to gently pinch the skin between the thumb and forefinger. For in these parts the head of the pin is liable to press on tender underlying structures, and thus lead to error." Referred pain is localised by the patient in the maximum spot of the tender area, and although many patients are aware of the presence of a tender area, they are principally concerned in describing the "pain" rather than the superficial hyperæsthesia. The following sums up the results arrived at. The upper incisors refer on to the fronto-nasal area, a racquet-shaped patch above the root of the nose reaching the hairy scalp and extending downwards towards the alæ nasi. The maximum point is over the supra-orbital notch. The canine and the first bicuspid refer to the naso-labial area which lies over the upper lip, tip and under surface of the nose, and on the cheek. It includes part of the lower lip, and extends, as a patch on the cheek, as far back as a line, dropped vertically from the external canthus of the eye. The upper second bicuspid is somewhat anomalous and refers sometimes on to the maxillary area, but in other cases to the temporal. The first upper molar refers on to the maxillary area lying over the upper jaw. The second and third upper molars refer to the mandibular area, which is roughly triangular and lies over the coronoid process, the ramus, and part of the body of the lower jaw, and it includes the tragus of the ear. The lower incisors, canine and first bicuspid refer on to the mental area, behind and below the angle of the mouth. It does not include the lower lip nor the part above the elevation of the chin, but runs along the border of the jaw. When the area is affected the anterior portion of the tongue on the same side is also affected. The second bicuspid is doubtful, apparently referring on to either the mental or the hyoid area. This latter area is associated with the first and second molars, accompanied by pain in the ear. It lies partly over the ramus of the lower jaw and partly behind its posterior border. It runs up also on to the mastoid giving rise possibly to "fictitious mastoid tenderness," and the lobule of the ear is also tender. Finally, the lower wisdom teeth refer on to the superior laryngeal area of the neck, the maximum point of which lies just in front of the sterno-mastoid muscle at the level of the pomum adami.

It will be seen that the above statements do not altogether coincide with what is understood to be the general opinion amongst dentists, but we may point out that Dr. Head's conclusions are based upon carefully recorded observations some of which are fully reported in his paper, and accompanied by excellent diagrams with the respective areas shaded. The subject opens up a wide field for investigation, and if some dental practitioners would only make a practice of recording on a chart the details of their cases there would soon be forthcoming a mass of valuable evidence. We are glad to find that Dr. Head proposes to deal with the matter further in a more special paper on pain due to diseases of the teeth.

Our Cousins.—One of the popular fallacies in connection with Darwinism is the idea that the distinguished observer traced the descent of Man from the Monkey. Mr. Lydekker in a paper in a recent number of *Knowledge* points out the true relationship between ourselves and the Man-like Apes. It is one of cousin-ship and not of ancestry. It is impossible to doubt that there is a relationship, but it is of a distant kind, for our common ancestor must have existed "ages before the mammoth roamed over the plains and valleys of England." As far back as that, Man was quite as much differentiated from his cousin, the Ape, as he is now. From the rarity of fossil remains of the man-like apes even in those countries where they have existed for ages, and from the probability that the area where the common ancestor lived was extremely limited, it seems somewhat hopeless to expect the discovery of the "link" which so many doubters demand.

Insecure Dentures.—Even when there are no immediately dangerous symptoms arising from the slipping of artificial teeth into the throat, there is always the possibility that serious results may follow. When the denture, for instance, lodges in the gullet there may arise cellulitis of the tissue behind, causing death. The *Journal für Zahnheilkunde* has a notice of the case in which an elderly lady swallowed her artificial teeth during sleep, another instance of what danger those people run who do not remove dentures at bed-time. The surgeon who was called, endeavoured in vain to recover the foreign body and then decided to push it into the stomach. This attempt also proved unsuccessful. For two years the patient suffered from hoarseness and difficulty in swallowing; food frequently stopped half-way and caused violent fits of coughing accompanied by mal-odorous expectoration. As these difficulties became unbearable, she consented to a medical operation—œsophagotomy. An examination by the laryngoscope showed a paralyzed vocal cord, and a probang came upon an obstruction 25 cm. from the teeth. Upon the patient being chloroformed, an endeavour was first made to remove the teeth through the mouth before opening the œsophagus, and this was fortunately successful.

ANOTHER MEDICAL DEFENCE ASSOCIATION.—Not long ago we drew attention to the steps which were being taken to amalgamate the two existing bodies charged with defending the interests of medical men. Each of these is still appealing for support, and now there is a third in the field, incorporated in a business-like fashion under the Companies' Acts with a capital of £10,000. Competition is good in many ways, but scarcely in such affairs as medical defence, and until some arrangement for combination is brought about, there must be, we think, a leakage in results, a loss of prestige in the eyes of legal authorities, and a waste of energy. Surely in this instance "Union is strength."

CINNAMON FOR PAIN IN CANCER.—The action of Cinnamon as an antiseptic is not unknown, and now in a cautious and yet hopeful manner, Dr. Carne Ross records cases in *The Lancet* where relief was obtained from pain by patients suffering from cancer. He recommends the use of a strong decoction made by boiling one pound of Ceylon sticks in a closed vessel for eight hours in three pints of water, until the quantity is reduced to one pint. It should then be poured off without straining and the sediment should be shaken up before each dose. Half a pint should be taken during the twenty-four hours in such doses as the patient finds best. In the majority of cases it agrees well if drunk soon after food.

Abstracts of British & Foreign Journals.

FACTS AND FANCIES ABOUT AMALGAM.

By M. B. Wood, D.D.S., Mankato, Minn.

The facts you may separate from the fancies according to your fancies, for you must admit that scarcely two will separate them alike, and admitting that, you will admit that a great deal of fancy enters into the practice of dentistry. I do not think a year passes without some prominent man in the profession making some positive statement in regard to some particular point in practice, and the words are scarcely out of his mouth before some one equally prominent makes a statement directly opposed to it. For this reason, we are all likely to side with the one nearest *our* method, while the other man's method, in *his hands*, may be as good, or better. In regard to amalgam. The first use made of it in this country, according to Dr. Cook in the *International*, was in New York city, in 1833, by the "Cracours," who were rated as quacks. Nearly every man in practice at the time felt outraged at the appearance of the material for the purpose, but it had not been on the ground long before most of them were using it on the sly, and in a few years they were not so sly about it. The first three regularly organized dental societies in this country (and I think in the world), denounced the material and the men who would use it. The first society, organised in 1840, through the report of its committee, is on record as saying that "the use of lithodion, mineral paste, and all other substances in which mercury is an ingredient, are injurious to the teeth, and that there is no tooth in which caries in it can be arrested and the organ rendered serviceable by filling in which gold cannot be employed."

At its fourth annual meeting this society declares the use of amalgam to be malpractice, and its sixth annual meeting it went so far as to oblige all those who wished to remain in the society to sign a pledge not to use it. Too many men had by this time learned the value of amalgam and more were learning every day, so that, in order to have any members, the society at its eleventh annual meeting was obliged to withdraw its pledge. It was in 1845 that a society was organized in Philadelphia ; this one did not denounce amalgam. From such an unpromising beginning amalgam has come down to us, often in the hands of disreputable men, but getting more and more into the hands of the best men, until to-day I think I am safe in saying that five teeth are filled with it to one with any other material.

We had, a few years ago, " the new departure," headed by three men, Dr. Flagg, of Philadelphia, Dr. Palmer, of Syracuse, and Dr. Chase, of St. Louis, who declared that in proportion as a tooth needed saving, gold was the worst material that could be used. Dr. Flagg and Dr. Palmer both advanced in their writings as another feature of the departure, " the chemical theory" claiming that the mouth is a battery and that certain materials produce certain remarkable results on account of chemical changes in the mouth. To this, Dr. Bogue, of New York, says: " That is simply their theory, they have never proved it and that it should not be accepted until proved. In some incidents of practice I have found some prominent men cautioning the profession against letting any part of an amalgam filling rest on the gum." Dr. Clowes, of New York, says that he takes two bicuspids or two molars that are decayed to shells, treats and fills the roots and fills the entire space not only between the roots, but between the teeth, letting the amalgam rest on the gum, and forming what he calls a " grand molar."

In 1888, Dr. Bonwill read a paper before the N. Y. Odontological Society bringing forward the method of packing amalgam with bibulous paper ; the paper was also to absorb the surplus mercury. He magnified his discovery and has received considerable favourable comment on account of it. Two years after this method was presented Dr. B. F. Arrington, who claims to have made a special study for thirty-five years of amalgam and the instruments for its manipulation, read a paper before the Southern Dental Association in which he stated that the use of bibulous paper for absorbing the mercury was an absurdity.

We frequently see the claim that this or that alloy is the very best on earth, because it is richer in gold and platinum than any other. In a paper read before the Massachusetts Dental Society, Dr. Page, of Charlestown, said that " gold does not increase edge strength, hardness or toughness. The only benefit is a slight increased plasticity and quick setting, and it makes a smoother filling. Zinc would produce a similar result in a much smaller quantity, and also retard black discoloration, which gold does not; therefore zinc is more valuable than gold. Twenty out of the fifty-four alloys on the market contain zinc. *Platinum is of no benefit* to amalgam; it increases brittleness in alloys, renders them brittle in proportion to the amount used. It may in a small degree produce quick setting, but this could be accomplished with zinc or gold without the injurious effects of the platinum." The same author says that "many dentists object to using mercury enough to make an amalgam plastic, for the reason that in pressing out the surplus a large percentage of the metals will be carried with it. This has no foundation in fact, as experiments have proved that only one five-thousandth of one per cent of gold and the same amount of silver, and only a trace of platinum too small to estimate, is pressed out of a mix of amalgam containing 480 grains. This is so small that there can be no objection to using all the mercury required to make a sufficiently plastic mixture." Two or three years ago I extracted a tooth containing an amalgam filling in good condition. The patient said the filling had been there over thirty years. Please compare this experience (and I have no doubt that most of you have had similar ones), with a statement made by the late Wm. H. Atkinson, who says: "I have seen fillings that were made by this Herbst method *over two years ago*, by Dr. Bodecker, and they have stood hard service without showing any evidence of disintegration or leakage. How many of us can say that of fillings made by other methods?" This seems to me a remarkable statement to be made by such a man in such company as the New York Odontological Society. Among the later comets in the amalgam universe we find copper amalgam. It came well recommended, and was used freely for a few years. A great deal of difference was observed in its working and behaviour, and many abandoned its use and have filled a great deal of space in the journals decrying the "dirty stuff," as they are pleased to call it. I think, however, that no more rage has been vented upon it in proportion to our members, than was spent upon what we call standard amalgam, by our fathers in the profession, and even now Dr. Hewitt, of Chicago, says it will, if properly used, stay where placed without cupping, wasting or perceptible shrinkage. It will not stain tooth structure, nor will it discolour contiguous gold fillings, and a writer in the Dental Review for July, 1893, says: "How much has been said on the amalgam question and how much more is needful to be said, that we may see a larger profit from its use? According to the present standard of knowledge we cannot do without amalgam. And Dr. Bogue says that the differences in many amalgam fillings are simply the differences of defective manipulation—occasioned through our own impatience or the impatience of our patients, the inaccessibility at the cavity, or the lack of time.

First, it is very desirable to apply the rubber dam in nearly all cases for amalgam fillings. Second, the amalgam should be worked *dry*. Third, in cavities on distal surfaces back of the first bicuspid the amalgam fillings of average operators perform better service than the gold fillings of the same operators in the same places. Fourth, a great many men who will not admit it are *average operators*.

The Dental Review.

Dental News.

DENTAL HOSPITAL OF LONDON.

A conversazione in connection with this institution was held at the Royal Institute Galleries, Princes' Hall, on the 19th ult. During the evening Mr. Christopher Heath presented the prizes to the successful students of the past session, after which he briefly addressed them on the past and present aspects of dental surgery. He congratulated them upon the fact that the dental profession had become an entity and upon the active measures taken by the General Medical Council to uphold the dignity and honour of the profession. The prize and class winners were as follows:—Saunders Scholar and winner of the Ash prize: N. G. Bennett. Certificates of honour: G. L. Bates. Dental Mechanics: W. S. Nowell, E. H. Mackley, and N. G. Bennett. Operative Dental Surgery: H. W. Norman, N. G. Bennett, H. E. Mackley, J. A. Gartrell, and S. J. Hankey. Metallurgy: N. G. Bennett, F. W. Jones, G. E. Frost, and J. H. Gartrell. Dental Anatomy: N. G. Bennett, W. S. Nowell, A. E. Betteridge, and H. W. Norman. Dental Surgery: N. G. Bennett.

Students' Society Prize: A. B. Densham. A capital programme of music was provided, and the opportunity was embraced by the staff and lecturers to urge the claims of the proposed new hospital, which is to be built on an advantageous site in the vicinity of the present hospital in Leicester Square, for which purpose the Committee require £40,000.

ROYAL COLLEGE OF SURGEONS, EDINBURGH.

During the July examinations the following gentlemen passed the First Examination for the Licence in Dental Surgery:—John Alexander Young, Edinburgh; Alfred Lamyman, Middlesbro-on-Tees; Seymour William Nicholas Swales, Sheerness; George Crichton, Perth; John Ainslie Duncan, Fife; Charles Herbert Fox, Gloucester; Boswall Cumming, Hull; Tom Tinley, Whitby; James Wallace Bell, Edinburgh; William Forsyth Tullock, Elgin; and William Jones, Edinburgh.

The following gentlemen passed the Final Examination and were admitted L.D.S. Edinburgh:—Kenneth John Roy, Dundee; Robert Atkinson Hudspeth, Newcastle-on-Tyne; Albert Leeming, Lancashire; Arthur Heron, Edinburgh; Alexander Cromar, Aberdeen; and Frederick Cornel Dopson, Liverpool.

EDINBURGH DENTAL HOSPITAL.

Professor Sir Thomas Grainger Stewart presided at the annual meeting of subscribers and distribution of prizes in connection with the Edinburgh Dental Hospital. There was a good attendance of directors, subscribers, and students. At the directors' meeting held previously, Mr. G. M. Stuart (of Messrs. Stuart and Stuart, W.S.) was appointed secretary, in room of Mr. Lindsay Mackersy, W.S., who has resigned the post. Mr. D. Bailie Wilson was elected extra assistant in dental surgery and Mr. Robert Lindsay was elected tutorial dental surgeon. The Dean (Mr. Bowman Macleod) submitted the directors' report, which spoke of the continued success of the school. Since last session 21 students had been enrolled. During the year now ended 12 students had completed their curriculum, and had gone up for the final examination for the L.D.S. of the Royal College of Surgeons, Edinburgh. There were now on the working roll 38 students, and that number would be largely augmented when the next session was opened in the new premises in Chambers Street. The work done during the session had been of a very progressive and satisfactory character. Year by year more attention was being given to the development of manipulative skill by a progressive course of technical instruction in the mechanical laboratory, a department which they hoped to see set upon a broad and liberal footing in the new laboratory, which would be much better furnished than their present one, thanks to the generous recognition of the Lord Provost and Town Council in their allocation of the Residue Grant. On the motion of Dr. Macdonald Brown, seconded by Councillor James Robinson, the report was approved of. The Chairman afterwards presented the principal awards, and in the course of some remarks, spoke of the excellent work which the institution had accomplished and was overtaking; and a vote of thanks was accorded to him on the motion of Dr. John Smith, who offered him the congratulations of the directors and students on his receiving the honour of knighthood. The proceedings then terminated.

A NEW ODONTOLOGICAL SOCIETY.

A new Society has been formed called The North of England Odontological Society. The first meeting was held in Newcastle-on-Tyne on July 25th. Mr. J. A. Fothergill was in the chair.

The Laws suggested by a provisional committee were discussed and adopted.

Messrs. Warwick Hele and R. L. Markham were elected Vice-Presidents.

Mr. W. G. Routledge was elected Hon. Treasurer, and Messrs. J. T. Jameson and W. D. Moon were elected Hon. Secretaries.

The following were appointed members of Council Messrs, W. Sommerville-Woodiwis, R. A. Turnbull, C. F. Sutcliffe, A. E. Knowles, S. Brown and W. J. Mason.

It was decided to hold meetings in Newcastle on the second Wednesday of each month from October to March.

APPOINTMENTS.

Mr. S. J. Hutchinson has been elected Consulting Dental Surgeon to the University College Hospital, in succession to the late Mr. Ibbetson.

Mr. R. E. Woodcock, L.D.S. Eng. has been appointed Honorary Consulting Dental Surgeon to the Pontefract General Dispensary.

We publish, without comment, the following article from the *Medical Press*, for the information of our readers, leaving them to form their own conclusions :—

THE DENTAL POLICY OF THE GENERAL MEDICAL COUNCIL AND ITS CONSEQUENCES.

Some months ago we called attention to the fact that—as regards the control of dental registration and education—the General Medical Council had accepted the position of agents for a certain body known as the British Dental Association. This body is not either professionally or numerically of much importance. It can scarcely be classed as anything better than a trade union, for its scientific work is insignificant and its public function has, heretofore, been limited to the driving out and keeping out of the professional market these who might successfully compete for fees. This Association has, however, been thoroughly well organized, and, therefore, has at its disposal a number of local branches throughout the Kingdom, which—though altogether insignificant in themselves—look as well on paper as if their opinion was entitled to consideration. The first instruction issued by the Association to the Medical Council was that it should "boycott" all foreign dentists because—as was unblushingly suggested—their professional competition was inconvenient to the home practitioners who form the British Dental Association—and "boycotted" the foreign practitioners were, according to order. For this proceeding there was and could be no sort of justification, because not only is the Medical Council entrusted by Parliament with the duty of registering competent foreign dentists, but it has pinned itself to the statement that it had investigated the examinational and educational credentials of the Colleges which granted these diplomas, and had found those credentials in all respects sufficient, and had, therefore, registered a number of the holders of these diplomas. It was, therefore, a setting at defiance of all public and professional opinion for the General Medical Council—as it did—upon the bidding of this Association to disfranchise not only the diplomas which it had recently enfranchised, but all foreign diplomas and diplomates whomsoever, and the audacity of the proceeding was the greater, inasmuch as the Council, in no obscure terms, gave as its reason the loss to the home diplomates by the foreign competition.

The next order issued by the British Dental Association to the Council was that it should impose upon the student and maintain for ever a three years' apprenticeship to a registered dentist as a *sine quâ non* of dental qualification. This return to the old apprenticeship system, which was abandoned forty years ago in medico-chirurgical education because of the notorious corruption and abuse to which it gave origin, was, we believe, found difficult of deglutition by some of the Medical Council, and the more so because the requirements for a dental diploma already contained ample provision for the education of the student in practical work. The student was already compelled to attend a special dental hospital for forty-five months, and to take out in addition a special course of practical and mechanical dentistry and metallurgy. The Dental Association had, however, issued its mandate, and it had to be obeyed. When a little unwillingness was evinced by the Council the whole force of the trade union branches was turned on, and the Council was deluged with letters and resolutions all formally expressed and officially signed by so-called Presidents and Secretaries, representing, probably, ten or a dozen ordinary practitioners, members of the branch. The pressure upon the Medical Council was unendurable, and it hastened to do as it was bid. It is necessary to state the exact truth about this proceeding. The fact is that these apprenticeships have been a comfortable and lucrative monopoly for the wire-pullers of the Association. Each apprentice represents for the three years served £150 or £200 clear profit to the master *plus* service as assistant—generally unpaid—for three years. Thus a good thing is made by keeping on hand three or four apprentices. In England, of course, this payment and the study which it is supposed to represent can easily be evaded by obtaining a certificate from a registered dental friend, and when the student elects to adopt this course the three years' apprenticeship resolves itself into a sham; but wherever a special dental school exists, as in London and Dublin, the staff associated with that school are certain to make a nice income out of *soi-disant* apprenticeships. This is especially true in Ireland, where registered dentists outside the hallowed circle of the Association are very few, and where the monopoly of apprenticeship fees is the more secure and lucrative. The last instruction of the Dental Association to the Medical Council, though obeyed with equal alacrity, has, however, opened up the whole subject of this manipulation of Acts of Parliament and regulations in the interest of this Association. The competition of advertising dentists, like that of foreign diplomates, is found to be inconvenient to the "superiorities" of the Association, and the Medical Council was directed to declare advertising to be "infamous conduct in a professional respect," and to be sufficient cause for striking the advertiser off the Register. Now, whatever opinion anyone may hold of the propriety of advertising by professional men (and we have ourselves deprecated such proceeding on all occasions and in the strongest terms), there is no scintilla of law or rule to make it "infamous" and the General Medical Council has no more power to make it law than this journal has. The attempt to "boycott" the advertisers has been already met by the establishment of a strong counter Association of advertising dentists for the purpose of contesting in the Courts of Law and in Parliament the project for "boycotting" them as the foreign dentists were "boycotted." If this defence should fail in law it is quite certain that it will not fail in the House of Commons, and that, if it is necessary for the advertisers to appeal thereto the General Medical Council and the British Dental Association will hear something neither agreeable nor to their advantage.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

THE FEE FOR THE LICENCE.

To the Editor of the "British Journal of Dental Science."

Sir,—Seeing in the Journal of August 1st your paragraph "To Parents and Guardians," referring to the increase of fee for the Licence in Dental Surgery, I think it should be pointed out to the Committee, that with a large percentage of Dental Students, the professional education commences, not at the time of their registration, but when articled to a recognized practitioner to learn mechanical work; and it would be only fair to all that the fee should be increased for those only whose indentures are not signed before the date mentioned, October 1st, 1894. Hoping you will find space for this,

Yours truly,
W. I. N.

To the Editor of "The British Journal of Dental Science."

Sir.—I would throw out a suggestion to Dentists on the Register not holding any Diploma (Licentiateship) to hold a meeting at some convenient town, and frame a petition to be forwarded to the General Medical Council, praying its permission to allow a new Diploma in Dental Surgery to be formed, to be registered like the present sine curriculo, save in this, I would suggest a modified curriculum. At the same meeting have a petition forwarded to the Senate of the Victoria University, praying them to open their doors and admit Registered Dentists to a modified examination for a Diploma in Dental Surgery, not sine curriculo. The curriculum I would suggest should embrace the subjects necessary for such examination, and occupy the period over which a Summer and Winter Session extends, 9 to 12 months attendance at any Hospital. I would also ask her Colleges, Owens, University, and Leeds, to institute lectures and demonstrations to such Registered Dentists who avail themselves of the opportunity of acquiring the requisite knowledge, the fees for the lectures—no dissections—to be as reasonable as possible.

The style and title of the Diploma to be Associate in Dental Surgery of the Victoria University.

If any of my confrères on the Register would call a meeting, and petition the two bodies named above, asking them to grant our request, I am sure a good object will have been obtained, and the public be the gainers.

In the matter of expense as to the curriculum (modified) and the examination fee, I think it might be brought very much under the present cost of the sine curriculo Diploma.

The Victoria degrees (Surgical) are accepted by the General Medical Council; why not have a Dental qualification and admit Registered men to a modified examination, the full qualification to carry, as does the English Diploma, the Licentiateship that is for the full curriculum as required by the Council.

There seems to be a great storm on the horizon; "Enquirer" is getting his guns shotted; why not confine his attention—if he wishes to purify the ranks—to the stopping of illegal practice by men not on the Register, stopping, and extracting teeth, administering anæsthetics, making and adapting artificial dentures, &c., &c., in fact doing anything and everything but call themselves Dentists, misleading the public. If there is no power in the present Act to prevent this, then I say protect the profession by adding another clause to the Dentists' Act that will. I know that merely Registered Dentists are looked down on by others holding the L.D.S.I., but let me have the curriculum, if only modified. I feel confident that there are hundreds of gentlemen on the Register who have the same feeling.

I am, yours,
A Registered but Non-advertising Dentist.

ANSWERS TO CORRESPONDENTS.

E. B.—We regret that we are unable to insert your letter, in consequence of the allegations against the Liverpool Press. In regard to the necessary steps to be taken against unregistered practitioners, Clause 4 of the *Dentists' Act*, 1878, as amended by the *Medical Act*, 1886, empowers a private person to institute proceedings against an unregistered person (not being a medical practitioner) who uses any description which implies he is specially qualified to practise Dentistry. As to the interpretation of the wording of the Act at present adopted by Magistrates, read the case reported on page 333, and still more recent decisions.

Paris.—You send no address, and we are unable to decipher your signature.

Down Bros.—Your letter appears to be an advertisement, and advertisements written as letters cannot be inserted in the reading matter of the Journal.

Dental Hospital Reports.

Work done at the Victoria Dental Hospital of Manchester during the month of July, 1894.

Number of Patients attended	908
Number of Extractions	451
Number of Extractions under Anæsthetics	169
Gold Stoppings	64
Other Stoppings	173
Miscellaneous (advice, temporary fillings, scalings, dressings, &c.)	554
Inlays	1
Crowns	6
Total	1418

Herbert G. Ashby, *House Dental Surgeon.*

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only, and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
6. The Journal will be supplied direct from the office on PREPAYMENT of subscription as under:

Twelve Months (post free) - - 14s. 0d.

Post-office Orders to be made payable at the Langham Place Hotel Office to G. E. Skliros, 289 & 291, Regent Street, W. A single number sent on receipt of seven (penny) stamps.

British Journal of Dental Science.

No. 639. LONDON, SEPT. 1, 1894. Vol. XXXVII.

ON THE TREATMENT OF CARIOUS MILK TEETH.*

By Edmund Owen, F.R.C.S.,
Senior Surgeon to the Hospital for Sick Children, Great Ormond Street.

Mr. President and Gentlemen,—A professor of astronomy once remarked to a fellow worker that he was going to set out upon the preparation of an essay on the cultivation of cray-fish! "But," said his friend, "you know nothing about cray-fish!" "True," replied the astronomer, "and it is because I know nothing of the subject, and am anxious to learn, that I have chosen it as my theme."

Now, my practical acquaintance with the subject of the proper treatment of carious milk teeth may be likened to that of the astronomer's knowledge of the cultivation of cray-fish, and my reason for inflicting myself upon you this evening may, like his, be considered rash rather than reasonable, personal rather than praiseworthy; but I wish to be informed. Having thus confessed the weakness of my position I will throw myself upon the mercy of the Court, and beg you to deal leniently with me.

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* Read before the Odontological Society of Great Britain.

Let me say again that I am not here as a teacher but as a learner. I claim that the spirit of the advice which Bottom gave to a fellow player may be applied to me: "*If you think I come hither as a lion, it were pity of my life; no, I am no such thing.* And there, indeed, let him name his name; and tell them plainly he is Snug the joiner."

But though I consider myself incompetent to say exactly what ought to be done with carious teeth in childhood, may I venture to place before you certain thoughts which have occurred to me, a general surgeon, in connection with this interesting and important subject? I do not expect that you will accept my views as altogether right, but, on the other hand, I am convinced that they are not altogether wrong. Still even if we agree to differ, I am sure that the time spent over the consideration of the subject will not be wasted. Whilst, if you will be good enough to admit that, after all, there may be some justification for my remarks, and give practical consideration to them, I shall be more than content.

The first question that I am going to submit is this: Are you satisfied, are you quite sure that your treatment of carious molars in children is sound and right? By this I mean, are you convinced that the insertion of a filling is the best treatment for the average carious molar of the average child? There is one answer which must not be given. It would be begging the question to say that treatment by filling the child's carious tooth is the result of evolving science, and, therefore, a distinct advance on the old measure of extraction. The adoption of novel and apparently scientific methods of treatment does not necessarily imply advance.

When a down-train and an up-train are side by side in a bustling railway station, the movement of the up-train makes the down passenger think that he is progressing when, as a matter of fact, he is standing still, or actually undergoing a little backward movement. He *thought* that he was advancing. Possibly you may be under the impression that dental surgery is constantly advancing in all its branches. If so, then, it is very different from general surgery. The evolution of "Science"—falsely so called—has recently, in at least two conspicuous instances, put back the hands of the dial of general surgery, so that at the present day the boy with a vesical calculus, and the man with a popliteal aneurysm do not stand nearly such a good chance of recovery as they would have done twenty years ago. No, advanced treatment is not always surgical progress. Can you show that the comparatively modern treatment of carious milk teeth is unmistakeable progress?

Some of you may have heard tell of a landed proprietor who, many years ago, had a tree on his estate which was doing harm rather than good. He told his gardener to remove it, but the gardener persuaded him to let it remain for another year so that he might "dig about it, and dung it." I wish that we could have known what was the result of this treatment, but the further clinical history of that tree was not recorded. My own opinion is that the tree did not answer to the means adopted, and that it was at last rooted up. But I do not speak from actual knowledge.

The line which I propose to take this evening in connection with the treatment of carious molars in children is somewhat after that of the landowner in the parable, and I place you in the position of the dresser of the vineyard asking that the teeth may be spared, so that you may dig about them and fill the excavations thus made with stopping. All that I want to imply is that I think you are carrying this treatment too far. I do not for a moment suggest that you are never to deal conservatively with carious milk teeth, but I wish to urge that many cases would turn out better without such treatment. From my point of view when it fails the failure is apt to be great and regrettable.

I think that I know why you so often decline or hesitate to extract the offending tooth ; is it chiefly on account of the fear which overshadows you lest its removal should prevent the due development of the maxillary arch ? If this surmise of mine be correct, I will ask if in your opinion the developing jaw depends for its perfect evolution upon the presence of carious teeth in its alveolar process rather than upon the dental sacs inclosed within its base. For my own part, I should think it probable that if every one of the temporary teeth were extracted soon after its eruption the basilar process and the jaw would, nevertheless, attain their normal size and shape in due course. But this is only a speculation, and you may possibly be able to show by chapter and verse that it is fallacious.

I suppose that you are also afraid that if the milk molars are removed the bicuspids and the permanent molars may, so to speak, have to scramble for their places with the risk of not finding room. That the first permanent molar—the six year old molar, I think you call it—will especially be impeded in its eruption, and will become awkward and unruly. Well, if the permanent teeth are going to crowd up in such an ill-mannered fashion, just because some carious and harmful milk teeth have been extracted, you can watch and weed them if there be not eventually room for them all. Surely this would not be faulty dental surgery. But then, you must have prolonged supervision over the child. Of course the most satisfactory way out of the difficulty would be to make the environment of the child such that the temporary teeth should not become at any time the happy hunting ground of septic micro-organisms, but remain sound and useful tissues until the permanent teeth were ready to take their place. Then all would go happily as wedding bells. But as this cannot be, let me ask you to regard the question for a while from the point of view of th general surgeon, and not to sacrifice the child's health and personal appearance—or risk their sacrifice—in order that the permanent teeth may be enabled to conform to some physiological standard as to size and site. Permit me to say that I believe that you are carrying conservative principles, most admirable in themselves, a little too far. In general surgery we are doing the same thing ourselves every now and then, and especially so, I think, in the case of local tubercular disease. Such errors come from our increasing power and knowledge. We are always anxious to save rather than to sacrifice, and thus the splendid spirit of conservatism is being occasionally discredited.

There is one point in connection with the dental surgery of children which I am sure has not received the attention which it so urgently demands—it is that children's mouths should undergo regular periodical inspection. With half a glance the dental surgeon sees what is wrong, and with comparatively little difficulty he could then put it right. But too often dental defects and irregularities are allowed to drift on undetected, uncared for, and when at last the dental surgeon is consulted, his opportunity has passed, or his power of doing good work is crippled. Further, I think that it would be a good thing if the Medical Council required that every one entering upon the general practice of our profession should possess at least a rudimentary knowledge of the anatomy, physiology and pathology of the teeth. And in that I have been so bold as to bring a Paper before gentlemen practising dental surgery, will not one of you offer, *en revanche*, to lay your views upon some common subject before one of our general medical societies? Such a paper might insist, amongst other things, upon the desirability of the general surgeon and practitioner possessing a working acquaintance with the number of teeth in the temporary and permanent sets, and of the respective dates at which some of the more notable of them should be expected to make their appearance. But it might, I think—at any rate for the present—omit from consideration the treatment of carious milk molars ; we shall have had enough of that to-night.

Let me now suggest a case for your consideration :—Here is a boy five years old with a carious lower molar ; it began to go wrong after a severe attack of measles. He is afraid to eat upon that side, and the tooth looks so unpromising that the dental surgeon to whom he has at length been brought, is disinclined to place in it even a temporary filling. The boy has had several attacks of toothache, and a lymphatic gland below the angle of the jaw is already enlarged and tender Why, I ask, does not the dental surgeon promptly extract that tooth ? I am sure that he ought to do so, as its removal may prevent the child becoming the subject of cervical abscess, for septic micro-organisms are already finding their way from the pulp-cavity to the associated lymphatic gland. Why does he decline to extract it ? He does decline, however, and I think that this is because he foresees some possible contingency in connection with the eruption of the permanent teeth. But, in the meanwhile, can he insure the child against secondary glandular abscess in the neck ? No. Therefore, to me, at least, his temporising appears unsurgical and dangerous.

Here is another case, but not so far advanced : It is that of a carious patch in the crown of the second molar of a boy of eight. He has had severe toothache, and a gland is tender below the jaw. The wall of the tooth is healthy looking and strong. The boy is a little Spartan. What are to going to do for him ? You will examine the tooth—the pulp is exposed and exquisitely tender ; you will devitalize it ; shape the cavity and bring down the soft tissue from the root of the fang by a Donaldson bristle. Am I right ? Have you ever had a Donaldson bristle passed up the fang of your own tooth? I have! And you may take it from me without question that no child could stand the ordeal twice; but unfortunately a molar has more than one fang; and unless you have thoroughly cleaned out each fang, filling the cavity is merely rolling a stone over the mouth of a whited sepulchre. In such a case future trouble is almost inevitable. The very germs with which the dental surgeon temporises in the alveolar region will subsequently be encountered by the general surgeon in the submaxillary glandular abscess of this boy. The opinion has been steadily forced on me that this advanced conservatism in dental surgery must be held responsible for no inconsiderable proportion of the cervical glandular abscesses of children. The dental surgeon *sometimes* permits his views to be limited by too narrow a specialism, refusing to look beyond the limits of the patient's dental arch. He should never forget that the germ-laden fangs may do incalculable damage to the glands along the sides of the neck; but he occasionally seems to cherish them with a regard and confidence which are as much misplaced as is the generosity which a Home Secretary extends to an Anarchist club.

Messrs. Smale and Colyer—to whose excellent book on dental surgery one naturally turns for enlightenment—say (p. 18), "It is also recommended by some, in the place of filling the pulp cavity, to cap it and perform rhizodontrophy." They have, apparently, nothing to urge either for or against this line of treatment; I much regret that they did not condemn it altogether. What is this but to convert the pulp-cavity into a natural incubator, in the moisture and warmth of which the septic micro-organisms will develop without let or hindrance? Messrs. Smale and Colyer thoroughly realise and duly refer to the great danger of the passage of these germs through the apex of the root; but I venture to think that the precaution which they advise against its occurrence is insufficient. They say that, before stopping the tooth, the canals should be tested to see if they are aseptic, " by passing a small piece of cotton wool on a bristle, and if free from odour when removed the cavity may be filled." I fear that septic organisms might exist in abundance in the tissues immediately adjacent to the area of excavation, and yet give no evidence whatever of their presence to this test. And even if there had been but a few of them present when the filling was inserted, the effect might have been as disastrous as if there had then been of them a host as countless as the stars of heaven.

Permit me thus to lay before you my conclusions:—Carious milk molars are often a cause of great distress to children, and they are always a dangerous source of septic infection of the cervical lymphatic glands. Unless the carious patch is slight and superficial it cannot be rendered absolutely aseptic, as children cannot tolerate the pain, manipulation and constraint which are needed for that purpose. The development of the jaw depends upon the presence of the dental sacs of the permanent rather than upon that of the milk teeth. To increase the happiness of the children, and to diminish the risk of glandular infection and abscess, the best treatment for the general run of carious milk molars is extraction. When a milk tooth is only moderately involved in caries, filling is of problematical value—the game is rarely worth the candle. Only when decay is slight and the child tolerant of thorough and efficient handling should cleaning and filling be resorted to.

WHERE UREA IS FORMED.—Experimental researches by M. Kaufmann, show that the formation of urea is not entirely localised in the liver; all the tissues produce a certain quantity though they are not so active as this organ.

VULCANITE WORK.

By Harry Rose, L.D.S. Eng.,
Lecturer on Dental Mechanics, National Dental College.

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(*Continued from page* 732.)

5.—A cooked vulcanite plate. For the description of this method of obtaining a matrix plate, I am indebted to my friend, Mr. W. R. Humby, who claims the following advantages :—

1st. In having a rigid vulcanite plate on which to mount the composition to obtain the bite or articulation.

2nd. To test the correctness of the model, and if necessary, when the teeth are mounted and waxed up, to again try in the mouth to ascertain their position and expression.

3rd. The trial denture approximates very closely to the perfect, and so gives one a better idea of the adaptibility of the case to the patient's requirements.

This method can only be applied to edentulous cases, and the making of the preliminary plate involves a little extra labour, but I am assured that for practical and perfect results it well repays for any extra trouble.

The principle of working is the following :—

After taking the impression of the mouth and pouring plaster into it,the resulting model is partly dried, and while still warm is painted over with a solution of chloro-rubber, corresponding to the size of the plate required; a sheet of rubber is then adapted to the model and trimmed to the required size.

The model coated with rubber is now to be embedded in plaster in a flask, and when the plaster has set it should be placed in the boiler to be vulcanized. On removal from the vulcanizer, the flask should be placed in cold water until it is, itself, perfectly cold. The rubber plate is now to be removed from the flask, and all traces of adherent plaster washed away.

The plate should be nicely filed up and the edges made perfectly smooth.

Some composition is next softened and adjusted to the plate, along its alveolar border, in order to try in the mouth and to obtain the correct bite.

After obtaining the bite, plaster of Paris is to be poured on to the superior palatal aspect of rubber plate, and a preliminary model formed as if pouring plaster into an impression; before doing so, however, all undercuts should be filled in with wax, or other soft, easily removable material, and the inside of palate either soaped or rubbed over with vaseline, so as to ensure its easy removal from the model for the purpose of trying in the mouth, if found necessary.

If the case is not to be tried in the mouth then the precaution of waxing up undercuts and the making of a preliminary model may be omitted and greater care should be observed in seeing that the inside of palate is free from particles of plaster or any imperfections before pouring in fresh plaster to form, what is to be, the permanent model for vulcanizing on.

Let us now presume that the waxed-up case has been tried in the mouth and the teeth arranged satisfactorily.

The next operation is to take a flask and pour some plaster into the lower part, (that is the part from which the guides spring) and also, after oiling, into the superior palatal aspect of the rubber plate which should then be turned over on to the plaster in the lower part of flask, thus forming the permanent model. The plaster when set should be trimmed to the edge of the vulcanite plate,and after dusting the palate of the case with French chalk, a piece of softened composition should be pressed into and adapted to it so as just to overlap the edges of molars and bicuspids and the backs of front teeth. This impression is cooled by dipping the case into cold water, and when removed is to be sunk in plaster in the steam swager and a polishing plate made, as previously described. After trimming the polishing plate to the proper size it should be fastened to the case in the flask, by touching it with a warm burnisher at the backs of teeth, and after soaping the plaster surface in the lower part, more plaster must be mixed and the upper part of flask filled in and the lid placed on.

When the plaster has had time to harden the flask should be heated to soften the wax, either by placing it on the top of a stove or Bunsen burner, or by putting it for five minutes in boiling water. This will facilitate the separation of the two halves of the flask and at the same time soften the wax sufficiently to allow of its parting from the vulcanite plate and to come away in the upper part of flask; the vulcanite plate will, of course, be on the model in the lower part.

To ensure the parting of the rubber plate from the model so as not to damage the latter should it present any undercuts, it should be held over a gas flame; the rubber will then soften, curl from the surface of model, and can then be readily removed. The wax in upper part has now to be washed away with boiling water and the case packed with rubber in the ordinary manner.

Number six in our list is the production of a contour plate by means of inserting a thin section, (see Fig. 2), between the two halves of a flask when the case is being packed.

An ordinary flask is divisible into three pieces which may be called bottom, upper part, and lid. To convert this into a section contour flask, it is necessary to have another piece about 2-16th thick between the lower and upper portions,(seeFig.2A). In order to produce a vulcanite plate by means of this flask, it is necessary to leave the section out when the case is mounted in the flask, but when the case is packed with rubber, it is put in its proper position; the rubber will then correspond in thickness to the sectional piece.

Now this will answer very well supposing we are only making a vulcanite plate, but in making a plate with teeth added, we should have the bite raised by the thickness of the section, unless precautions are taken. These precautions con-

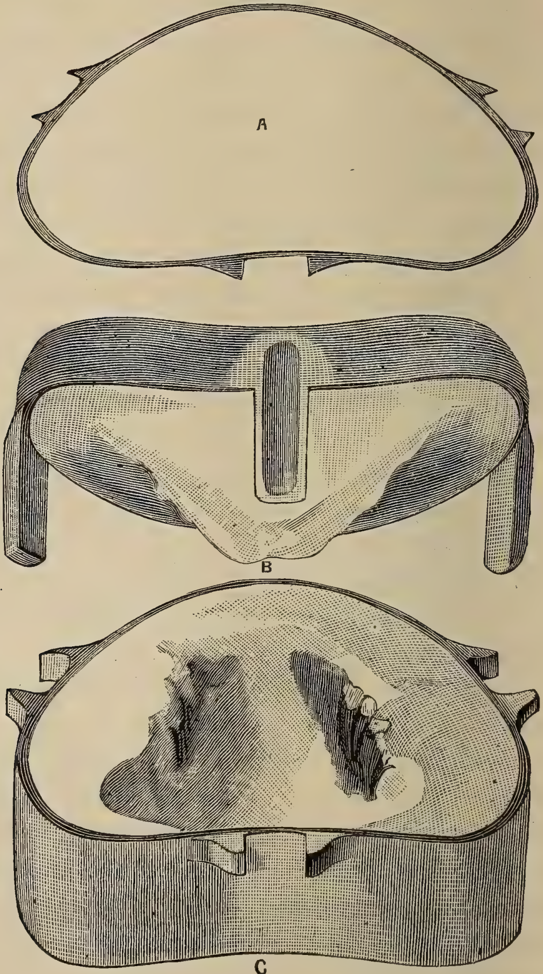

Fig. 2.

sist in so fixing the teeth in position, that they cannot rise, and thus the only thickness will take place in the palate.

To make this appear quite clear we will take an upper partial case, and mount the teeth, tacking them in their places, and waxing them up neatly, but not putting the wax plate over the palate.

When ready, the case is placed in the upper part of flask with the plaster covering the edges of the teeth. A polishing plate can now be made to this, or the surface may be painted with silicate of soda, before finally closing the flask.

It is then trimmed up, and when hard, the plaster and palate of model are soaped, so as to allow the polishing plate to come away. Some more plaster is now mixed and poured into the palate, and into the lower part of flask, and it is then squeezed to make the edges of the flask fit tightly together.

When the plaster has become hard, the flask should be either warmed on a stove, or placed for a few moments in boiling water; this will cause the two halves of flask to part readily. It will thus be seen that the teeth are fixed, and the only part that could be affected by a separation of the halves of the flask is the palate, and that only to the extent of the thickness of the section which will be placed in position when the case is packed and ready to boil out.

The only methods of producing a polished superior palatal surface (not lingual) that I know of, are the following:

The first consists in coating the model with gold foil just before closing the flask after packing the rubber. The second is to take a plaster impression of the mouth and by the aid of the steam swager, blow a meter metal plate into that; and the third process is to dry and coat the model with chloro-rubber, mould a rubber plate to it and vulcanizee Carefully clean and file up the rubber plate and utilize that to blow a meter metal plate into, taking the precaution to have the plate perforated at the deepest part, and to mount in plaster of Paris before removing from the swager, to prevent bending or damaging the thin metal plate.

With the first process we increase the size of model by the thickness of gold foil, with the second and third we produce a metallic plate of the exact size of impression, so that when plaster is poured into it, it may serve as the model.

Having in the preceding pages given a description of the various means adopted for producing vulcanite plates, I will now proceed to explain how the teeth are mounted on them.

Whenever there is gum in front or at the sides of a case, it is essential for strength that the teeth be hollowed out so as to allow of the thickness of rubber beneath them to be of sufficient strength to support the rubber in front, or at the sides, and thus lessen the risk of its being broken away.

To commence with, I will take as an illustration the models of a complete edentulous set, using the wax plate on which to mount the teeth. The plate, especially for an edentulous case, should be made as broad as possible, in the lower jaw bringing it well over the mylo-hyoid ridges posteriorly—this steadies the case and is of great assistance if springs are not contemplated.

Having moulded a sheet of wax to the lower model, to which it should be tacked with a warm instrument passed around the edges, we begin to mount the teeth after having first bent the pins in a suitable manner to retain their hold in the vulcanite. They should be flattened and bent at right angles to the tooth and where possible clubbed at the ends; care must also be taken to bend them downwards or upwards as the case may be, towards the gum margin, so that they do not shew through the rubber when the case is being filed up. This latter precaution is very commonly omitted, and such a mistake mars the beauty as well as the strength of the best piece of work.

Having placed the composition dummy piece on the upper model and fixed it there (Fig. 3.), we now commence to mount the lower teeth, beginning with the two lower centrals, the upper dummy case serving as our guide for projection, length, and centre of mouth.

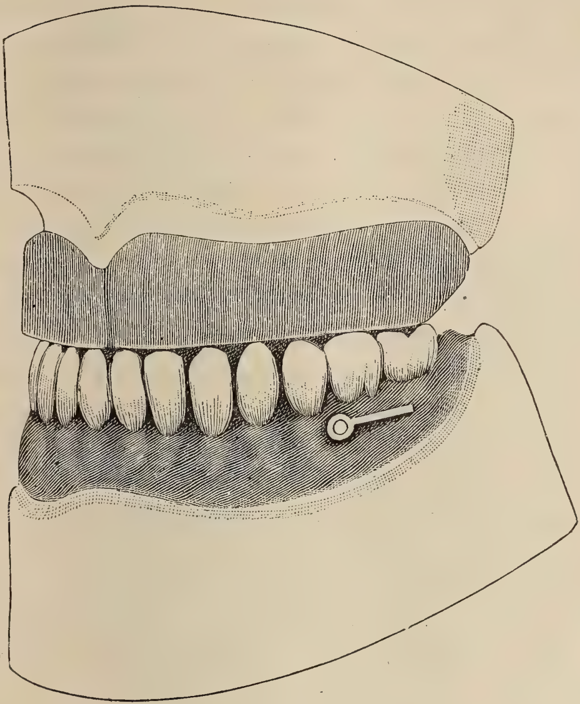

Fig. 3.

Some degree of irregularity in the position of the front teeth should be attempted in order to make them more natural in appearance and to conceal their artificial character.

One central should be a little shorter than the other and both centrals slightly overlapped by the laterals ; this turn of the laterals brings the canines apparently into greater prominence, thereby giving a fuller and more pleasing expression to the lower lip.

Of course care must be taken to avoid any pronounced "fierce" isolation of the teeth.

The points of lower canines may be bevelled on their labial aspect giving them a better edge for biting and also an appearance of being worn down. A part of the internal cusps of the first lower bicuspids is also ground off so that they do not present such an abrupt angle next the canines, which is not natural, and would only get in the way of, and irritate, the tongue. The second bicuspids should be kept out a little further than the first, and placed more upright. The first molars still further out and the second molars in a line with the first.

If it is intended to put springs on a set, the arch must not be expanded in the molar region more than is absolutely necessary, as the springs would then come into too intimate contact with the cheeks and irritate them to such an extent that the case could not be worn.

It is therefore best in such cases to contract the arch slightly or else to use narrower teeth.

In smoothing and trimming up the wax, care must be taken to give as natural an appearance to the gum as possible, and where swivels are inserted, the buccal portion of gum extending from the second bicuspid backwards should be formed so as to afford support for the springs and prevent them from slipping down upon the mucous membrane.

Having mounted the lower teeth, the next business is to remove the composition dummy piece from the upper model.

The upper model must now be prepared by fixing a tin, lead, or india rubber disc to the centre of the palate to form a suction chamber,and by making within the circumference of the intended plate, with a steel point, a shallow groove to form a ridge or series of ridges on the finished case. (Fig. 4.)

I generally make two sets of grooves, one extending round the case, and the other extending from the tuberosities on each side and passing round the soft substance of the middle portion and sides of palate.

These grooves, or rather the ridges resulting, convert the whole case into one large suction chamber, and they help in a great measure to prevent the primary suction of a case from failing, as a slight movement does not raise or tilt the case sufficiently to free these ridges from the depressions they make for themselves in the soft portion of the palate.

These grooves should not be cut too near the edges of the plate in case it is found necessary to reduce it, when the ridge would be cut away and its utility destroyed.

A line should likewise be made round the circumference of a suction chamber if the use of the latter is decided upon.

The suction chamber can be made either round, heart-shaped, or oval, in the latter case a small chamber may be formed on either side of the bony ridge in the centre of the palate.

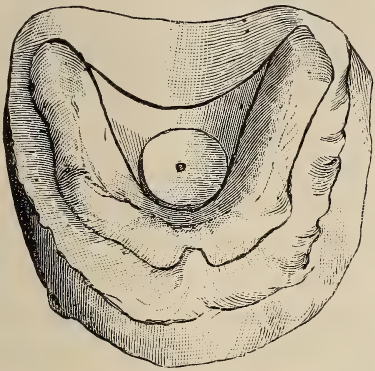

Fig. 4.

The heart-shaped chamber besides its powers of suction is also to keep pressure off the centre of the palate when the ridge is more elevated than usual, and even in the event of not using a suction chamber, it is often found necessary to take he pressure off this ridge by placing a layer or two of tin foil along it, extending to a quarter of an inch of its posterior border.

The upper model being prepared a sheet of wax is moulded, to it and trimmed up into form and size after which it is tacked to the model by a warm instrument as in the case of the lower.

Too much care cannot be taken in mounting teeth. Some cases are spoilt by the teeth being too long, others on the contrary are too short; in the first case the patient looks all teeth and in the second the patient's friends ask her what has become of her teeth.

The upper dummy case or "bite" should guide us as to their length, and notice must be taken whether the patient has a long or short upper lip. Too much regularity is also to be avoided, for nothing looks worse to an artistic eye than an extreme regularity of artificial teeth, for we must recollect that our best efforts should be to conceal our art.

In some cases it may be necessary to grind the artificial teeth to conform to the shape of the natural teeth.

This is best done with teeth that are of one texture throughout, such as Ash's, and the glaze or surface comes out of the body by heat. Teeth such as these can be cut and polished, whereas a porous tooth, or one upon which the glaze is put afterwards, cannot be polished again after being ground.

We must also bear in mind that the more the teeth are kept on the alveolar ridge, and the more directly the pressure is brought to bear on them, the greater the suction, stability, and masticating power.

In fact, the greatest power of mastication is obtained from a case in which the teeth are placed to what is called an edge and edge bite, such as we see in the mouths of middle aged men, when the teeth are worn down somewhat by hard use.

If the teeth are placed prominently as they sometimes must be, there is a pressure outwards and forwards, and a tilting from the back of mouth; in these cases the pressure of the bite should be greatest in the molar region. This will not prevent the front teeth from antagonising, for we find that in the natural bite the front teeth can be articulated, and yet the back teeth do not of necessity touch.

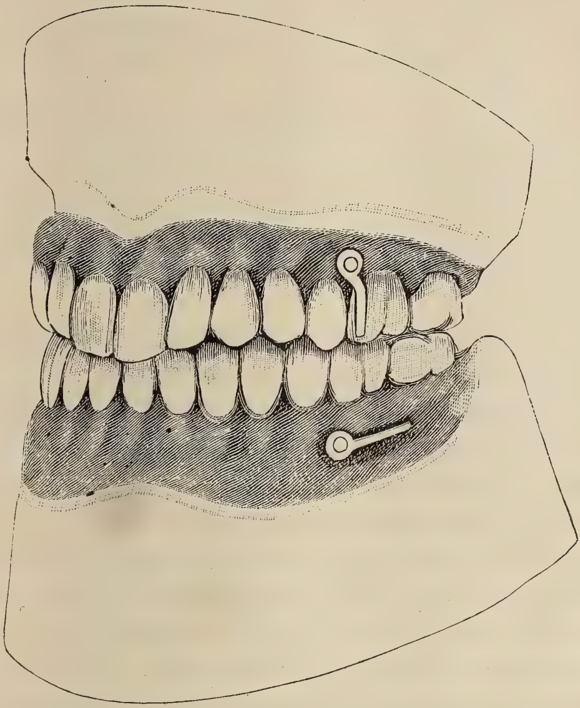

Fig. 5.

Beginning with the two central incisors, we must mount the teeth on the wax plate as nearly as possible in the situation on the alveolar ridge formerly occupied by the lost natural ones, and their cutting edges should overlap those of the lower incisors. (Fig. 5).

The next teeth to arrange are the laterals; these are not brought out quite so prominently at their necks. By arranging the points of these teeth so that they overlap to some slight extent the central teeth, a very natural appearance is produced; they may also lean towards the front teeth, and look slightly shorter. The mesial angle of the tooth is much more pronounced than the distal, thus allowing one to give a distinctive character to the canine or next tooth to be mounted, which should be more prominent both at the root and point than the laterals.

The canine tooth, and the fulness over the root constituting the canine eminence, is instrumental in giving expression to the upper lip; great care is therefore necessary in arranging these teeth satisfactorily. They should cover the distal half of the lower canines, and the mesial half of the first bicuspid.

The first upper bicuspid is now placed in position next the canine, it is made slightly shorter than the canine, and should be placed somewhat less prominently than that tooth. It should articulate with the distal half of the first lower bicuspid, and the mesial half of the second, and the outer cusps must overlap those of the lower.

The second bicuspid should be placed somewhat further out than the last named, and is generally made somewhat shorter than the other, it should fill in the concavity between the second lower bicuspid and first molar. The first molar is now placed in position, and should be articulated with the lower, and describe, with the second molar, a more rounded arch than that formed the corresponding teeth in the lower, except where the case is intended for spiral springs, when the molars may articulate edge and edge in order that the springs may not come in the way of the cheeks. Having now mounted the teeth we must build up the representation of the gum, and fill in round the backs of teeth, this should be done neatly, carefully removing any surplus wax, and bearing in mind that it will facilitate the finishing process if this part of the operation is done in an artistic manner.

The next operation is to take an impression of the palate and backs of the teeth; this can be done by softening a small, piece of composition, flattening it out to a suitable size, and, having previously dipped the case in cold water to prevent the softening of the wax, it is then moulded to the surface of the palate and the backs of the teeth, and dipped into cold water again, and finally removed.

This will give us an impression which we can either cast in plaster, and thence obtain a zinc model, from which to stamp up the polishing plate, or which we can use to place in the steam swager as previously described.

(*To be continued*).

GENERAL PATHOLOGY AND SURGERY FOR DENTISTS.

By Edmund W. Roughton, M.D., B.S., (Lond.),
F.R.C.S. (Eng.)

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WOUNDS.

A wound is a solution of continuity due to mechanical violence. In an *open* wound the skin (or mucous membrane) is divided ; in a *subcutaneous* wound the damaged tissue is not exposed to the air.

Open wounds present the following varieties:—

Incised wounds are those made by sharp, cutting, instruments. A minimum of damage is inflicted on the wounded part, and therefore healing is likely to occur without suppuration. Their chief danger is hæmorrhage.

Contused and *lacerated wounds* are those inflicted by blunt instruments, machinery, etc. The tissues are more or less bruised and torn, and therefore healing is apt to be attended by suppuration.

Punctured wounds are those made by pointed instruments such as needles, bayonets, daggers, etc. A punctured wound is of necessity more or less contused, and being deep and unable to drain efficiently is apt to heal slowly and to be attended by suppuration.

Poisoned wounds are those which have been inoculated with some form of virus. The virus may be a chemical one as in the sting of an insect or a snake bite, or a living one (bacteria) as in a post mortem wound.

The Healing of Wounds.

It was at one time thought that "immediate union" might occur between two wounded surfaces if they were accurately brought into apposition. It is now known that such a process does not occur, and that in whatever way a wound heals, the process of repair is always the result of inflammation. The following are the ways in which a wound may heal.

(a) *By first intention.* The injury causing the wound acts as an irritant and causes just sufficient inflammation for the process of repair, and no more. It is essential that no other source of irritation should keep up the inflammation, for then suppuration would occur. Let us suppose that a deep incision be made in any part of the body and the wound spread open so that we can see what is going on. The immediate result would be hæmorrhage, which would cease after a time owing to the wounded vessels becoming occluded by blood-clot, and by other means which will be more fully described subsequently. In a few hours a moderate degree of inflammation would ensue, the neighbouring vessels would dilate and plastic lymph (liquor sanguinis and white corpuscles) would be exuded both into the tissue itself and upon the wounded surface. As the lymph was exuded so it would coagulate, thus the surface of the wound would become glazed over. Presently serum would begin to ooze out in beads on the glazed surface and run down in little streams to the most dependent part of the wound, like drops of rain on a window. Now let us suppose that instead of our wound being spread open, the sides of it have been brought into accurate apposition, so that no space is left between them, the result would be that they would be stuck together precisely as two sheets of gummed paper would be. Thus the wounded surfaces are temporarily united, or gummed together by lymph (see Fig. 5).

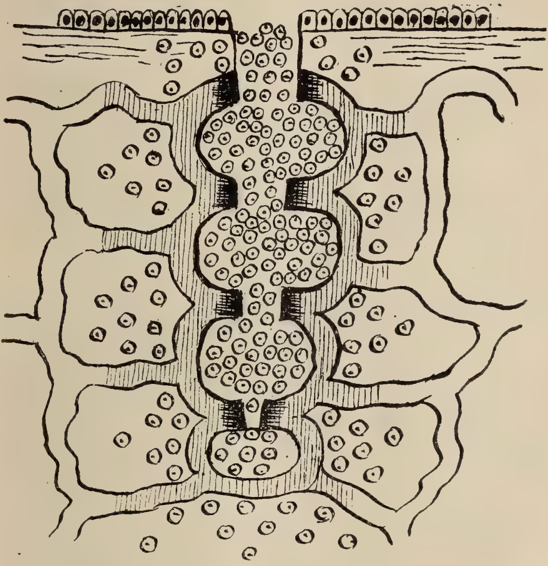

Fig. 5.

UNION BY FIRST INTENTION.

The Surfaces of the wound are gummed together by plastic lymph. The divided ends of the capillaries are occluded by blood clot, and the neighbouring tissue is inflamed.

After a few days the neighbouring capillaries send out little buds into the lymph which thus becomes vascular. The lymph is then gradually converted into fibrous tissue. The epithelium from the neighbouring skin or mucous membrane grows over the surface of the wound, and the healing is complete (see Fig. 6). The resulting scar is at first reddish in colour, but as it contracts the new vessels which it contains become obliterated leaving it pale and non-vascular.

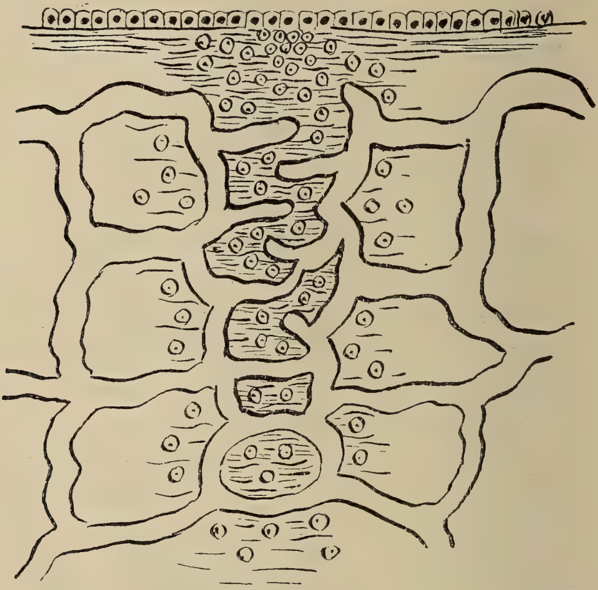

Fig. 6.

UNION BY FIRST INTENTION.

The Surfaces of the wound are joined together by newly formed fibrous tissue which has become permeated with capillaries. The epithelium has grown over.

A wound may be prevented from healing by the first intention by the following conditions :—

1. Bruising of the edges of the wound, leading to death

of the adjacent tissue. Dead tissue cannot undergo repair; it must be cast off as a slough or become absorbed.

2. Constitutional or local conditions producing a state of lowered vitality of the part wounded. A healthy tissue will stand more irritation without suppurating than a diseased one will.

3. The presence of foreign bodies in the wound may prevent healing by first intention by separating the surfaces to be united, by causing irritation, or sometimes, as in the case of blood-clot, by forming a nidus for the growth of bacteria.

4. Want of apposition of the surfaces of the wound. Two pieces of gummed paper will not stick together unless they be placed in contact; neither will the surfaces of a wound.

5. Want of rest acts by prolonging irritation and by destroying the delicate uniting medium.

6. Inefficient drainage of the wound leads to retention of serum, which separates the surfaces of the wound, produces tension, which is in itself an irritant, and forms a nidus for the growth of germs.

7. Inoculation of the wound by septic or infective bacteria, the presence of which may prolong the irritation.

(b) *By second intention or by granulation.* As the result of any of the conditions just mentioned, the inflammation may be prolonged, and so many inflammatory cells formed that they die for want of nourishment and form pus. The surface of the wound then comes to resemble precisely the wall of an abscess or the floor of an ulcer, and healing takes place in the manner already described. (See Healing of an Abscess.)

(c) *By third intention or union of granulating surfaces.* When two healthy granulating surfaces are brought into contact they fuse with one another. This often takes place when a large abscess has been opened and its walls allowed to approximate.

(d) *Healing under a Scab* is not a distinct process of repair. The scab simply forms a natural dressing for the wound, and if it happens to be aseptic and non-irritating, the wound underneath it heals by the first intention. If it becomes septic (i.e., invaded by bacteria) suppuration takes place underneath it, the pus lifts it up and escapes at one side, and healing takes place by granulation.

TREATMENT OF WOUNDS.—Our object is always to obtain union by first intention when that is possible, therefore our treatment consists in avoiding or combating all those conditions which we know prevent this process from taking place. The chief indications are :—

1. To arrest hæmorrhage. (This subject will be considered subsequently.)

2. To remove all foreign substances by gentle sponging or washing.

3. To accurately approximate the *surfaces* of the wound by means of sutures, strapping or bandages. It is not sufficient to approximate the edges only.

4. To keep the wound at rest.

5. To provide efficient drainage. In most wounds it is only necessary to keep the surfaces in contact and so obliterate the wound cavity by carefully applied pressure. When this cannot be done a drainage tube must be inserted to allow the serum to run off.

6. To exclude bacteria of all sorts. This brief sentence really comprises the whole of antiseptic surgery. Here it is only possible to point out a few general principles. When a wound has already become septic, we must kill the germs it contains by means of antiseptics such as perchloride of mercury and carbolic acid. When we intend to make a wound, as in the performance of an operation, we must so arrange

matters as to prevent as far as possible any germs from getting into it. Thus it will be seen that *our antiseptic treatment is directed not to the wound itself, but to the different sources of infection by which it may become contaminated.* Bacteria may be conveyed to a wound by the atmosphere, by the hands of the surgeon or his assistants, by instruments, sponges, dressings, etc., and from the patient's own skin or mucous membrane. Therefore in planning and conducting an operation the following points must be attended to :—

(a.) The room in which the operation is to be performed must be as clean and free from dust as possible. Formerly the carbolic spray was invariably used, it has now been discarded because it has many drawbacks, and because it is now recognized that the air is one of the least important sources of infection. When the operation is concluded antiseptic dressings are applied, one great object of this is to filter and so purify any air which subsequently reaches the wound.

(b.) The hands of the surgeon and of those who assist him must be scrubbed with soap and water and dipped in carbolic acid (1 in 40) or perchloride of mercury (1 in 1000). During the operation the surgeon's hands must not touch anything which has not been purified.

(c.) All instruments must be carefully cleansed before being put away and again immediately before use. Boiling in water is the most efficient means of purifying them ; after being boiled they should be placed in a solution of carbolic acid (1 in 40). Instruments should not be put in perchloride solution or they will soon lose their polish.

(d.) The skin covering the part to be operated on should be well washed with soap and water, shaved if necessary, and then covered with an antiseptic dressing for some hours before the operation. When the wound is to be made in a mucous membrane, the soap and water must of course be dispensed with, but it should nevertheless be well mopped over with cotton wool soaked in perchloride solution (1 in 1000).

It should be clearly understood that antiseptic applications do not possess any healing properties, on the contrary they are all irritants and therefore the less they are applied to the surface of the wound itself the better. An ideal antiseptic would kill bacteria without doing any harm to animal tissues; unfortunately no such thing exists.

(*To be continued.*)

DENTAL EDUCATION.*

By V. Haderup, M.D., Copenhagen.

Mr. President, Ladies, and Gentlemen—The happy circumstance that we have at our meeting, several much appreciated colleagues from the other Scandinavian countries, and also several distinguished colleagues from foreign countries whom we know regard the question of education with the greatest interest,—this circumstance makes me quite hopeful that the present meeting will provide the impulse to realize a wish I have so long entertained, viz :—the founding of an International Society for forwarding Dental Education.

Previous to this meeting I have, in regard to such a plan, conversed and corresponded with several colleagues upon whose opinion on the matter I lay the greatest stress, and I am pleased to say that I have met with the warmest universal sympathy. Amongst my correspondents who are prevented from being present, I will name Professor Miller (Berlin),

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* Read at a meeting of the Copenhagen Dental Society.

Professor Heidé (Paris), Dr. Coulliaux(Milan), Docent Witar Rhode (Dorpat) and last, but not least, Dr. Ulmgren (Stockholm). This colleague, in a letter regretting very much his inability to attend, has explained his ideas fully upon the subject. He writes as follows:—"As to your idea—which is just the same as mine—respecting an international society for the arrangement of dental education, I quite agree, and think that the establishment of such a union may constitute a real progress in a question which has been the order of the day for so many years. It may be a progress from many aspects, and not least because we dentists ought to show that we at last understand that we are independent people,acting in harmony as a corporation like the rest of the medical profession. Above all we must show that we place ourselves on medical ground and are nothing but a special branch of medicine. This we must first prove to the world. Until those concerned, that is the medical profession and the public, understand this, we have nothing to hope for." Thus writes Dr. Ulmgren, and while he declares his sympathy with my idea, I on the other hand cannot find better or more striking words than his in which to explain the introduction of my proposal. Recognizing the authority of Dr. Ulmgren, I find valuable support in his consent to my plan, but at the same time I do not receive from his letter any assistance in carrying it out. Whilst he repeatedly expresses his complete agreement, he points out the difficulties to be met in forming such a society, and hardly knows how the international union may come about. Other colleagues who are attending the meeting have made similar declarations. Dr. Cunningham wrote me thus some days ago. "It is an excellent idea but difficult to work." And the refrain of his letter is:—We must talk it over first of all. By conversations during the last few days we have, I hope, come to an agreement upon the main points. And if those who are interested in forwarding dental education agree that the plan is good and worth putting into force, then I do not believe that the difficulties of its realisation will prove so great. A society whose members have, to such an extent, a common and mutual interest will need administration to but a small degree.

What should be the aims of such a Society? First of all it must, through its managing Committee obtain complete and absolutely reliable information regarding the arrangement of dental education in the different countries which are represented in the Society. An Annual might then eventually be published by the Society, and it would be of great use in the forwarding of education if the Managing Committee could serve as an office of information. You know that when there is a tendency to reform in a country, we never omit (in reference to the distinctly international character of our Art) information relating to other countries. Those who have tried to obtain such information know how difficult it is to get official documents, and how unreliable the so-called accessible sources may be. To every new observer it will seem astonishing what little knowledge the profession in one country has of the other, even in neighbouring countries, regarding educational matters. I may, for instance, mention that in Swedish and Norwegian official reports of recent years essential mistakes are found in reference to Denmark. A union with co-operating representatives in the different countries would be able to obtain reliable information with much greater facility in respect to this. If the information were published as a complete international review upon dental legislation and administrative matters, which was yearly corrected and supplemented then this might act as an effective stimulus for the medical authorities of the respective countries, making public in a practical way the existing alterations of administration and acts. On the other hand, such a review would no doubt increase the interest of dentists generally in educational affairs, a thing I consider of the greatest importance.

The first object, therefore, of the Society may be to gain information of the various acts and Institutions, but by this only a knowledge on paper is obtained. The next and, in my opinion, far more important is that those persons acting in the matter, or interested in it, might get an actual mutual understanding, might find occasion to discuss, and to become personally acquainted. In order that this may be done extensively the association must hold an international meeting, by turns, in the respective countries, and the agenda, besides pedagogic questions, should contain other subjects presenting interest both for the profession in general and the public. It may, I think, be desirable that at such meetings transactions should be attached relating to other matters of international co-operation, as for instance, the collective investigation as to the teeth of school children. If such meetings restrained the international dental congresses in their present form I think in reality little would be lost.

By these means, if my suggestions prove fertile, a co-operation on educational matters will develop quite naturally, on the one hand, private, on the other, official, in some way we may leave a future organisation to decide.

I have not thought that we are able at this meeting to *start* an international association. For this the representation here is at any rate insufficient, and besides, I am quite aware that the matter in question demands the most careful consideration and discussion before being put into action. On the other hand, this meeting might be fully competent to appoint a committee (having power to add to their number) to prepare rules for such a union and to try and secure sympathy and approval for it in the different countries amongst dental lecturers and others interested in the subject, and whom it might be fitting to admit to the

Association. This Committee should have authority at such time it might find suitable, say before the elapse of two years, to call an internationally constituted meeting.

My first thought was to try to form a union composed only of dental lecturers, and these would always be the nucleus of the Association ; but considering that the progress of dental education is of such great importance relative to all dental matters, I think such a union ought to find partakers outside the limited circle of lecturers, and would only improve by coming into closer connection with dentists generally.

Considering that the English proved standard of Dental Education is, if not ideal still the best existing at present, and considering that the English Dentists stand in the best relationship with the government, the medical profession, and the public, I should wish that in the near future we can found an *International Society for the promotion of Dental Education, under an English presidency.*

A POMADE FOR TEMPERING STEEL.

Beck's tempering medium consists of 50 parts colophony, 40 parts turpentine, 10 parts linseed oil and a mixture of powdered salts, consisting of 65 parts ammonium chloride, 6.6 parts potassium sulphate, 13 parts potassium nitrate, 4 parts sodium nitrate, and 11 parts of asafœtida. Melt the oils and gums together, and add the saline mixture little by little, whipping it well in. Stir until cold, so as to insure the even distribution of the saline powder.

VASELINE IN MICROSCOPY.—Galalowski proposes to replace cedar oil and other liquids used for oil immersion for objectives by vaseline, whose refractive index is 1.40.

Rundshau.

British Journal of Dental Science.

LONDON, SEPT. 1st, 1894.

DENTISTRY IN DENMARK.

We have received from Mr. Bramsen, one of the secretaries at the recent Dental Congress at Copenhagen, a condensed account of the proceedings, and it may be interesting at this moment to consider briefly the main points as to the present position of the Dental Art in Denmark. We agree with Dr. Haderup, whose paper at the congress we also publish, that it is a matter for surprise that so much ignorance should prevail as to the dental status existing in neighbouring countries. We have recently alluded to the new regulations which have come into force in France, but it may be news to some that in Denmark there has already been, for some years, a wholesome system by which dental practice has been practically restricted to qualified men. It is true, as we shall see, that there is still a leakage, but the fact that only those who have passed through the necessary curriculum and examinations are legally entitled to practise as dental surgeons (*tandlæge*), shows that Denmark is not behind the times. So far back as 1873 a regular examination was established for dentists, admission to which depended upon passing an examination in general preliminary education. Before this time certificates, only, were required as a proof of some general education and technical skill, but the new arrangement required the making and inserting of artificial dentures as a preliminary test before the candidate is admitted to the final dental examination. This is an interesting feature in connection with a resolution recently carried at a large meeting held here in England, recommending that an examination in Dental Mechanics should be passed before the Hospital work is begun. In Denmark, a Royal Act in 1888 added a clinical side to the examination, which had up to then been theoretical. This necessitated the establishment of a dental school and infirmary which is under the presidency of one of the lecturers on Surgery of the Medical Faculty of the University. Two teachers are also appointed, one for the clinical work, who must be a dentist practising in Copenhagen, the other, for the theoretical courses, must be a graduate of the medical school. One point, which we would recommend to the notice of the Council of the Royal College of Surgeons in Ireland, is that the student must do at least two years work as a pupil of one or more dentists practising in Denmark, in addition to a course at the Dental School. As a corollary to the institution of a curriculum and examinations, the Government at the same time provided regulations for the practice and limits of dental surgery. From these it would appear that the dental practitioner must restrict his work to the diseases of the teeth and gums; he must not prescribe internal remedies, nor produce general anæsthesia without the assistance of a qualified practitioner.

We have been told that it has not been found difficult to carry out in practice the limitations imposed by these Regulations as against surgical practice proper, but whilst the dentist has thus remained loyal, he has suffered to some extent at the hands of a class of "dental mechanics" who carry on business as manufacturers of artificial teeth. This state of things, as might be expected, has given rise to numerous law suits. As far back as 1844, the Board of Justice decreed that the manufacture and insertion of artificial teeth must be recognised as a part of free trade. The difficulty which, under the new regime, has arisen is as to how far such manufacturers may undertake the preliminary treatment of the patient's mouth. As a rule the law suits have proved that in order to insert artificial dentures, the manufacturers are obliged to transgress the law, inasmuch as they are prohibited from performing any operation whatever, such as the extraction, excision, or filing, of teeth or roots. We have heard of one case in which two dental students sent a patient with a loose upper canine to a tooth manufacturer for a complete denture. He ventured to remove the tooth and render the upper jaw edentulous. Upon this evidence a conviction was secured. We do not express an opinion as to the advisability of carrying on the warfare in this manner, in fact we believe it has been the cause of a considerable difference of opinion in dental circles in Denmark, but it is interesting to hear that in some cases there has resulted an alliance between an unqualified and a qualified man carrying on practice together in order that the former may avoid prosecution. In short, it has led to a species of what in England would be termed "covering."

So far as we can learn, it is in the direction of State help for improved teaching arrangements, and opportunities for hospital practice, that those in authority in Denmark are looking, and we cannot help thinking, with Dr. Haderup, that much good to all concerned would follow a more extended international acquaintance of Dental Institutions and Government Regulations.

EXTRACTION INSTEAD OF THE BIRCH ROD.—A schoolmaster in Austria has been tried for inflicting bodily harm upon some of his pupils. Knowing something of dentistry, and having a horror of physical punishment generally, he thought it would be a benefit to his patients, we mean pupils, if some more tangible results might be the outcome of pain inflicted scholastically. So the dunces had decayed teeth extracted *in coram populo*, and the spectators were duly impressed. In his defence the schoolmaster urged he was really conferring a favour upon the boys in making their mouths healthy. An expert, in the person of a well-known dentist, was therefore appointed to investigate the matter for the prosecution, and he found himself obliged to report in the defendant's favour. Although we cannot approve of leading school-children to regard dentistry as a punishment, this case may attract the attention of some of our foreign colleagues who are anxious to find at least one means of forcing home upon public authorities the necessity that exists for attention to school children's teeth.

POST OFFICE DENTISTRY.—A correspondent to *The Standard* draws a somewhat ghastly picture based upon so-called facts. A girl who had passed the necessary examination for promotion in a post-office was informed by the medical officer that she must satisfy "the local General Post Office dentist, who supplies sets of teeth free from the General Post Office, and no doubt at General Post Office prices, to General Post Office assistants." The tale goes that the dentist found slight unsoundness in one or two teeth and the girl was at once informed that she must forego her promotion or allow fourteen teeth to be there and then extracted! The teeth were extracted at one sitting. We should be glad to know the conditions of appointment of a dentist who supplies sets of teeth free from the General Post Office. We know that candidates may have to produce a certificate from a dentist as well as from the medical man, but we do not believe that there is any obligation to lose a dozen sound teeth.

A NEW GAS.—Lord Raleigh has announced the discovery of a hitherto unknown gas which constitutes 1 per cent. of the atmosphere. Lord Raleigh and Professor Ramsay obtained about 100 cc. of the new substance, but they have not been able to distinguish the new substance by any specific chemical reactions. If air be subjected to electric sparks and the nitrous fumes absorbed by potash and the excess of oxygen by alkaline pyrogallate, there is a residue which is neither oxygen nor hydrogen.

Abstracts of British & Foreign Journals.

THE INDICATIONS OF DENTAL EXOSTOSIS.

By Mary Linde, Ann Arbor, Michigan.

Sometimes hypercementosis exists without giving rise to any trouble. When the dentist is called upon to extract a tooth or a root, for some reason or other he will, in these cases, be greatly surprised to find hypertrophy of the cementum, and on request he will hear that the new growth has never perceptibly disturbed the equilibrium of ease. In these instances the deposit has been a very gradual one. It is not these cases which are liable to puzzle us in our practice, but it is where this affection results in so-called idiopathic neuralgia, and the patient requests of us to make a diagnosis as to the cause of the symptom. This is a very difficult task in almost all cases ; often we can only arrive at a conclusion when every other disease is excluded ; sometimes we shall fail entirely, because we cannot locate the pain on account of its reflex character. If the pain is localized, the diagnostic peculiarity is that of a dull, gnawing, uneasy sensation, a pain not absolutely persistent, but decidedly remittent, even intermittent, but not returning periodically. The pain is not agonizing, has never the decided paroxysmal acuteness of pulp irritation ; it has length of duration instead of intensity. In rare cases we are able to feel the enlargement by passing the finger over the side of the root. Sometimes there is looseness of the tooth in its socket, the peridental membrane is congested, the tooth feels longer, and is sore to percussion. But, as a rule, the most careful local examination does not reveal anything. There is no enlargement indicating the abnormal growth, because the alveolar process is absorbed, and it is this space that is taken up by the hypertrophied portion. The gums seem perfectly normal. Lateral pressure and percussion give no response. If the local indications are not decided, the history of the case may guide us. The gradual increase of the uneasiness and the great length of time during which this additional growth develops is one of the most certain diagnostics of dental exostosis. It never takes less than months, usually a year or two, even more.

When the seat of disease cannot be localized, it is impossible positively to determine the existence of hypercementosis. In these instances the affection has proved capable of producing almost any amount of suffering, sometimes of frightful severity.

In order to be able to make a diagnosis, we must know the conditions which are liable to bring about this change. While Tomes attributes exostosis in a great majority of cases to caries, other writers differ with him, and, as it seems, for good reasons. Flagg, Abbot and Guilford find the main cause in malocclusion, protrusion of fillings under the gum margin, and in some cases slow deposition of tartar. Any irritation which would stimulate the functional action of the peridental membrane and not exceed its nutrient capabilities, must result in excessive formation of cementum. Marshall believes that beside other causes, hypertrophy of cement tissue is an occasional occurrence in individuals of a gouty or rheumatic diathesis, due to an undue amount of uric acid in the system; most commonly found in chronic cases of long standing, and often associated with enlargement of the joints, long bones, or nodular formation in other localities, conditions which are somewhat analogous. If, therefore, we do not find any local cause which could account for the occurrence of excementosis, we do well to enquire for the diathesis to these diseases, and whether previous extractions have demonstrated the presence of exostosis. When we get an affirmative answer as to the existence of the rheumatic diathesis, we cannot say yet that our diagnosis is correct; we are not yet justified in opening the drawer for the forceps as the only means of relief to our patient. Interstitial calcification of the pulp, formation of so-called pulp stones, frequently occurs in persons of gouty and rheumatic tendency. It is this affection with which hypercementosis is most easily confounded; both give rise to severe neuralgia, and in both cases no external symptom indicates the true character of the trouble. There will be no other choice for it than to open the pulp chamber and to extract the pulp. If pulp stones are present we shall in most instances be able to save the tooth; the attempt to do so will be our duty. Imbedded wisdom teeth sometimes give rise to the same range of trouble as dental exostosis. After we have excluded all these different causes of the same symptoms, we have the right to conclude that the affection is caused by hypertrophy of the root or the alveolus, the latter being exceedingly rare, we presume hypercementosis.

Having thus conscientiously made our differential diagnosis, we are justified in employing the forceps; the difficulty with which the extraction is performed will, in most cases, tell us that our conclusion was correct before we convince our eyes. But as has been said in the beginning, it is often utterly impossible to diagnose with absolute certainty. The extracted tooth may, after all, not have been the cause. In such cases the dentist ought not to feel discouraged, having uselessly sacrificed a tooth. It is always better to sacrifice a tooth than to impair the health of the individual by administration of powerful narcotics. The dentist knows that he has not acted thoughtlessly. He arrived at his conclusion after conscientious searching for the cause, and if his conclusions proved to be a failure, we all make mistakes.

Dental Register.

THE LAWS OF PROFESSIONAL ETHICS.

By W. C. Barrett, M.D., D.D.S.

There are three great professions, Medicine, Divinity and Law. The first cares for the physical well being of man, the second for his spiritual good, while the last looks after his vested and communal welfare. Thus the vital interests of all men are entrusted to one of these professions, and when the weight of responsibility is so great, common justice demands that commensurate care should be exercised to prevent the entrance of improper or unqualified persons. Hence a proper term of pupilage is prescribed, at the end of which the student is granted a diploma, certifying to this fact, and formally admitting him within the precincts of the profession. This diploma is the only door of admission into Medicine, and no man, it matters not what his learning or ability, can be considered a medical man without its possession.

The door of admission into Divinity is through an examination by competent authority, after the pursuing of a proper course of study, and the formal induction into the sacerdotal office. In Law, the form is much the same. All professions must carefully guard their immunities against improper conduct on the part of those once admitted, and the laws to secure this form the ethical code by which all are or should be bound. The distinction between a profession and a trade must be carefully maintained, for that is the only means by which imposture and fraud can be avoided. In business, it is possible for the purchaser to examine the wares that are offered to him, and so to be his own judge of their value. The seller may vaunt them unduly, but there is a check upon him, because the article shows for itself. It is not so in a profession. That which is offered is special or professional knowledge, concerning which the purchaser can have no information. He must place himself in the hands of his professional adviser with blind faith, and there is no opportunity for him to know the exact value of the services to be rendered. The methods, therefore, which are quite legitimate to trade must be prohibited the professional man, and hence he is forbidden to advertise or unduly vaunt his skill. Were this permitted, the temptations to mendacity and deceit would be irresistible to many men, and there would be no opportunity to expose the fraud until too late. Therefore, any member of a profession is forbidden to advertise in the public prints, unduly to vaunt himself, or to publish certificates, under penalty of being prescribed as unworthy a place in a profession. The rule is a necessary one, and must be enforced if there is to be any profession at all, or any such thing as professional honesty and rectitude.

Dentistry ranks as a profession. It is a branch of Medicine, and in that rests its claim to the distinction. Although dentists have existed from the earliest days of civilization, yet until within a few years it has never been organized separately, but was practised as a part of the great healing art, and, as now, its only claim to professional honour was through the parent Medicine. But do not let us plume ourselves too much upon this. It is not every so-called dentist who is practising a specialty in Medicine. When you take proper cognizance of pathological conditions, and set about the treatment and cure of oral diseases through the action of medicine, and by hygienic and therapeutic methods, you are practising a part of Medicine, and are entitled to rank as strictly professional men. The prosthetic department of dentistry, while quite as important from a dental professional stand-point, has no connection with the medical part, for it is something of which the parent profession has no knowledge, and which is not included within it. The dentist, then, should not neglect theory entirely, for if he does he severs the only tie which binds him to the mother profession.

The Dental Practitioner.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting, June 4, 1894. Mr. Frederick Canton, M.R.C.S., L.R.C.P., L.S.A., L.D.S., President, in the chair.

The Minutes of the preceding meeting were read and confirmed.

The Librarian reported that Dr. Ottolengui's book, "Methods of Filling Teeth," had been added to the library. Also that he had received in exchange *The Transactions of the Royal Medical and Chirurgical Society.*

The following gentlemen were balloted for and elected as members:—Henry Barbery Rowe, L.D.S. Eng., 7, Cavendish Square, W.; S. Ralph Apthorpe, L.D.S. Eng., 1, Tweedy Buildings, Widmore Road, Bromley, Kent; Gerald Bertram Webb, L.D.S. Eng., Guy's Hospital, London, S.E.; John Dencer Whittles, L.D.S. Eng., 17, Sumner Row, Birmingham.

The following sent obligation forms duly signed:—Leslie G. Austen, L.D.S. Eng., Cambridge House, Portsmouth; Aubrey H. B. Farebrother, L.D.S. Eng., 3, New Street. Salisbury.

The following gentlemen were proposed to the Society:—Ashley Bloomfield Densham, L.R.C.P., M.R.C.S., L.D.S. Eng., 18, Stratford Place, W.; Louis Jeffrey, L.D.S. Eng., 1, Newton Villas, Finsbury Park, N.; George Thompson, L.D.S. Eng., 4, Park Place, Torquay.

The Curator said some specimens of teeth had been sent to the Museum by a non-member, showing rather marked cases of exostosis.

Casual Communications.

Mr. Routledge in describing a low voltage motor for attaching to any ordinary dental engine without the necessity for structural alterations to the latter, said:—

This low voltage motor is one especially designed to work efficiently with an electric current at low pressure. The reason for designing such a motor is perhaps not at first apparent, but I will explain. Where the only source of current is a battery of cells, it requires a *number* of these to obtain a high voltage. The voltage depends upon the number of the cells, not upon the size of them. Hitherto the great objection to motors has been the large initial outlay requisite for cells ; now, whereas other well known motors require from four to six accumulator cells to drive them efficiently, this one will do the same work and only require two. This advantage is a real one—the cells take up less space, require less attention, and best of all, the first cost is reduced to less than half. Again, apart from electrical considerations, take the motor as a purely mechanical device ; regarded thus it has one strikingly good feature, one which makes it unique, in fact it is this that affords it its title, viz., a motor for attaching to any ordinary dental engine without the necessity for structural alteration to the latter, This again is a material advantage. Should the cells suddenly run out, or any little temporary derangement occur to the electrical fittings, the dental engine can be made available for pedal power again in a few moments. Again, the question of first cost tells immensely in its favour, a new stand, flexible arm, handpiece, etc., is not requisite as with other motors ; the ordinary dental engine is available without any alteration except an extra pulley-band

As to the advantage possessed by this method of driving over the old foot power, too much cannot be said ; the operator is relieved of the necessity for standing in that constrained position rendered necessary by having to drive the engine with the foot while operating with the hands, and the consequent oscillation of the body which more or less occurs.

At other meetings where this motor has been exhibited I have been asked the following question: Is the motor available for the direct or alternating current? The answer is that this one was constructed to run from accumulator cells, but it can easily be adapted to either the direct or the alternating supply.

Mr. NORTHCROFT exhibited three pairs of pliers which he had found very useful in his own practice. The first pair was for bending up pianoforte wire for regulation plates. By its use the turns in the wire were made very quickly and at the same time very evenly. It was also useful for forming up the "w" spring. The second plier or punch was formed so as to make caps out of soft white metal for use in cases of exposed pulp. By using these caps the pain to the patient was reduced to a minimum, and, combined with the use of fibre, he had had no difficulty in any case tried for many mouths. The pliers were made with three sizes of holes, so that three different sized caps could be made with the same punch. They were inexpensive, and would well repay the initial outlay. The third pair he used to hold teeth in crown and pivot work where it was wished to file the edges of the backing. It was a great saving to the finger nails, and kept one from marring the hands when doing this form of mechanical work.

Mr. BLAND SUTTON exhibited a follicular odontome removed from the left half of the mandible of the lad presented to the Society at its last meeting by Mr. J. F. Colyer. The tumour was removed in the following manner. The mucous membrane was reflected from the expansion of the tumour which projected towards the cheek ; the bony wall was then divided with cutting forceps and the tumour shelled out by means of a raspatory.

The odontome had a firm thick fibrous wall, and the crown of a molar, with five well-developed cusps, projected into its cavity. The two roots of the tooth, though somewhat irregular, were complete—an unusual circumstance. It was thought the tumour might be an epithelial odontome but it turned out to be a follicular odontome (dentigerous cyst). He was right as to genus, but wrong as to species.

To sum up the circumstances of the case briefly, it might be said that diagnosis was good, but not perfect ; the operation, simple ; recovery, very good ; deformity, none ; the specimen interesting and useful for teaching.

Mr. GEORGE ROWELL then made a communication "On the Comparative Effects of Gas, Gas and Oxygen, and Gas and Air," which we published in our last issue.

Dr. HEWITT said Mr. Rowell had put the matter so clearly before the Society that little was left to say. His remarks were of very great interest as showing that by prolonging the administration of nitrous oxide they could obtain a longer anæsthesia. He hoped Mr. Rowell would be able to continue his comparisons, for if they could get together 100 or 200 of such cases they would have distinct lines to go upon, but even as the cases stood they showed very clearly the relative advantages of the three methods. With regard to the use of air with nitrous oxide he had very little experience, because he usually preferred to administer oxygen, but he was quite with Mr. Rowell in believing that the use of air with nitrous oxide was certainly preferable to nitrous oxide alone, and was only inferior to the method in which oxygen was used, because the depth of the anæsthesia could not be so evenly graduated, and they were rather liable to overstep the proper boundary either on the side of giving too little or too much air. There was only one slight disadvantage connected with the use of oxygen, and one which he never lost an opportunity of pointing out, viz., that after a prolonged administration, where possibly oxygen was used in considerable proportions, there was greater tendency to nausea—especially with boys and girls—than when nitrous oxide was used alone. He should like to know whether the prolonged administration of nitrous oxide when air was added to it was also likely to lead to this after effect. To himself it was the greatest possible puzzle, and he hoped one day to be able to understand how it was that in boys 12 to 14 years of age when nitrous oxide and oxygen were given together for a considerable time, something like a minute and a half, there was a tendency to sickness afterwards. He had completely given up the use of nitrous oxide for patients of this class, and in fact for most patients, so that he was not really in a position to state whether it was so with ordinary nitrous oxide. It certainly was so with nitrous oxide and oxygen, and he would like to know whether it was so with nitrous oxide and air, because the avoidance of after effects was a matter of considerable importance in discussing the merits of any system of producing anæsthesia. The use of air with nitrous oxide no doubt lessened the tendency to stertor and jactitation, but in dealing with little children the use of oxygen was far preferable because in these subjects they could not graduate the admission of air with anything like the delicacy that they could admit oxygen. Therefore for very young children the use of air with nitrous oxide was certainly very considerably inferior to the use of oxygen.

Mr. Edmund Owen then read a paper on "The Treatment of Carious Milk Teeth," which we publish on page 769.

A very interesting and lengthy discussion followed.

The President moved the thanks of the meeting to Mr. Owen for his paper, and also to those gentlemen who had forwarded Casual Communications.

Dental News.

COPENHAGEN DENTAL SOCIETY.

A very successful meeting of this Society was held at the University on the 13th and 14th ult., and as many visitors were present from other countries, and as the subjects for discussion were of international importance, the proceedings were regarded in the light of a Congress. President Thorlakson occupied the Chair, and amongst those who accepted invitations were Dr. Grevers (Amsterdam), Fricke (Kiel), Fenchal (Hamburg), Brün (Christiania), Carlson (Gothenburg), Forssman and Sandstedt (Stockholm), Ayräpää and S. C. Benzon (Helsingfors), Cunningham and Spokes (England). The forenoons were occupied by discussions on "The Teeth of School-Children," introduced by Herr Fenchal, and "International Dental Education," opened by Dr. Haderup. The afternoon sessions were devoted to demonstrations which included glass fillings, the use of electrical apparatus, antral disease, Logan crowns, &c.

The discussions were well maintained, the majority of those present understanding German and English, as well as the Scandinavian languages.

The following resolution was carried :—"That this international meeting of dental surgeons at Copenhagen, August 13th and 14th, declaring dental caries to be a disease of a progressive character amongst all civilized people, earnestly recommends that stringent precautions should be taken, and proposes that Commissions should be appointed in the different countries, under the approval of the Local Government Board to examine the condition of the school children's teeth and take measures according to the results obtained." Following the discussion upon Dr. Haderup's paper, a provisional committee was elected consisting of Dr. Cunningham for England, Dr. Grevers for Holland Mr. Sandstedt for Sweden, Dr. Brun for Norway, Mr. Fricke for Germany and Dr. Haderup for Denmark.

Dr. Cunningham showed a large number of slides in the electric lantern, illustrating the importance of scientific attention being paid to to the teeth, and also a method for the immediate regulation of irregular teeth.

The social part of the Congress was not forgotten. The first day concluded with a Danish "Sexa" or supper at the Tivoli. On the following evening the members assembled for Dinner at the Sopavillonen, where a list of toasts and speeches was accompanied by the "hurrahs" peculiar to the Scandinavian Countries. Drs. Haderup, Bramsen, and Secker worked hard to make their visitors welcome and the meeting a success.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the "British Journal of Dental Science."

Sir,—Mr. Christopher Heath, in distributing the prizes at the Dental Hospital of London, is reported to have said that "In 1859, a charter was obtained, and an even more important matter followed in the Dental Act of 1878, which made an immense difference in the profession. Previous to the passing of that Act there was no compulsion for any Dentist to educate himself, and anybody could call himself a Dentist without let or hindrance." And so he can now. There is nothing to prevent anyone doing so. A man not qualified or registered, according to our recognised law, can put up American Dental "Institute," or "Association," or "Surgery," who possibly has never been in America in his lifetime. Who prevents him from practising? No name appears, consequently no one can inform himself whether his name is on the Register or not. All these so-called Associations, Institutions, or Surgeries ought to be compelled to put the responsible manager's name on the plate, the man who is in charge and who sees the patients.

Mr. Heath goes on to say, "The subsequent and improved Act of 1886, which had the effect of bringing the profession under the knowledge and power of the General Medical Council, was more stringent than the Medical Acts, and it was much easier to bring a Dentist to book than a Doctor." He goes on to say—"They had to congratulate themselves that the Dental profession had made so great progress in the last few years." Has it? Well, that is a question. Progress undoubtedly there has been in many *ways* and in *individual* cases, but some of the L.D.S.'s turned out by our Hospitals are a sorry lot. These young fellows emanate from their examination bursting with Theory and Conceit with their L.D.S., but as regards practical experience they are totally deficient. Many an one of them could not make an artificial denture if he tried, or fit it into the mouth either; and when such work is made for them by a good Mechanic in their employ, owing to bad impressions of the mouth, and defective articulating of the Bite, the case is so cut about in fitting, that when it returns to the workroom to be *refinished*, it is hardly recognisable by the workman, and he sees a case, on which he has bestowed a lot of pains, simply ruined.

As to the reopening of the Register for bona-fide Dentists mentioned by "L. L." I never heard of it, and, like yourselves, refuse to believe such is the case. I know men who ought to be on the Register, and cannot get there. There will have to be some alteration no one can deny. Let us have the whole question put on a fair footing. Right is right, and we ask nothing more.

"ENQUIRER."

To the Editor of "The British Journal of Dental Science."

Sir,—I observe a letter in your issue of the 15th inst. upon the subject of modified examination for unqualified men who are already on the register. With all deference to your correspondent's opinion I am afraid he is hardly conversant with the subject on which he assumes to write. He is evidently not aware that such a state of things has been in existence for some considerable time, yet he propounds his scheme with an earnestness which suggests the idea of his labouring under the delusion that the gift of originality had been bestowed upon him.

He proceeds to say that qualified men would be pleased that the registered men should be able to join the qualified ranks (much more easily) and make one unanimous noble order, in a word, that all would then be the recipients of the Diploma. En passant, I do not think that the diploma could be much respected. It is true that the writer does not say this in so many words, but it would be the conclusion that most of us would draw from his remarks. Now, what I want to know is this — How can it be consistent for one man to take his diploma on a modified examination, where another his junior must work harder and longer to enable him to pass a much more difficult examination, to say nothing of the former working away on the old school lines and the latter being educated up to date. If anything, the matter should be reversed, inasmuch as that the registered man has had the privilege of practising in years past, which to the present compulsorily hard working student is denied, in other words the present dental student must qualify to practise, and the man with past privileges (who in many cases is able to rest on his laurels), be allowed to rank on a par with him by passing some paltry modified examination. The suggestion is too unfair and onesided to recommend itself to your readers.

Yours,
DENTAL AND CONJOINT STUDENT.

Devonport, Aug. 22, 1894.

To the Editor of the "British Journal of Dental Science."

Sir,—Can any of your numerous readers explain why dentists are allowed to practise without Registration? I know of instances where this is done openly, and the most glaring advertisements are published in the newspapers. If the "Dentists' Act," is of no value, pray let it be known, and let us return to the old days again, but to have matters in this unsatisfactory state appears to me the height of absurdity.

Yours &c.

ARTICLED IN 1858.

To the Editor of "The British Journal of Dental Science."

Dear Sir,—A letter which I observe in your issue of the 15th inst. may doubtless prove interesting, and in sympathy with the writer's colleagues. As he happens to be a registered man but unqualified, the hardest hearted man must perceive that this matter must perforce be near and dear to his heart. Far be it for me to be or appear to be in the slightest sense abusive; but in the name of goodness, why does your correspondent advocate a modified form of examination for registered men? Why give them so much of his sympathy, as though they had ever been a downtrodden and disparaged class of the social community? No! it is emphatically the qualified man and better man who is classed in this category; then, I say, why in the world should an obviously privileged class receive an advantge which we have not? Why should they rank on a par with us if they do not pass the identical examination which we have to pass? I have heard it said, "Let the old fellows pass a modified examination." Well, perhaps the old fellows referred to are on the verge of that "bourne from which no traveller returns"; then what do they want with a qualification now, as they have practised all this time without one? But I must not omit to mention that your enlightened writer has an erroneous impression of self-intuitive originality. When we can be corrected, let us take it with a good grace; for the modified examination has been in existence some considerable time. In conclusion, all registered men will openly sympathise with your correspondent's letter, and all qualified men or those who intend to qualify, cannot see anything consistent in such a modified form of examination.

Yours truly,

Penzance. CORRECTICUS.

British Journal of Dental Science.

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GENERAL PATHOLOGY AND SURGERY FOR DENTISTS.

By Edmund W. Roughton, M.D., B.S., (Lond.), F.R.C.S. (Eng.)

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(*Continued from page* 796.)

SURGICAL FEVER.

In health the temperature of the body is about 98.6° F. being slightly higher in the evening, and lower in the morning. Heat is generated in the body chiefly by oxidation of of the tissues, and is lost chiefly by conduction and radiation from the general surface, and by evaporation. These processes are under the direct control of the nervous system and are constantly being regulated and balanced to suit surrounding circumstances. In many forms of disease the heat-regulating apparatus is disturbed with the result that the temperature rises above the normal, producing *fever* or *pyrexia.*

The General Symptoms of Fever are malaise, shivering, thirst, loss of appetite, constipation, furred tongue, hot dry skin, flushed face, high-coloured scanty urine, rapid pulse and respiration, headache, sleeplessness, delirium, etc. The amount of fever is indicated by the use of the clinical thermometer. It may vary considerably in degree and duration.

A temperature of 102° or 103° is usually regarded as "moderate" from 104° to 105° as "high," above 105° as excessive or hyperpyretic. In rare cases the temperature may rise as high as 110° or 112°. When the temperature goes up and remains at about the same level it is called "continued," when it falls at intervals (but not to normal) it is called "remittent," when it falls at intervals to the normal or below it, it is called "intermittent."

THE CAUSES OF FEVER. At one time it was thought that fever symptomatic of inflammation, was due to the blood becoming heated in the inflamed part; it is now known that the blood in a vein returning from an inflamed part is not hotter than in the corresponding artery. The fever of inflammation is due to two causes:—

(a) The absorption into the blood of some pyrogenous (heat-producing) substance from the inflamed area; which acts as a poison to the heat-regulating apparatus and causes increased production of heat throughout the body.

(b) Disturbance of the heat-regulating apparatus by stimuli passing from the inflamed area through the nervous system.

VARIETIES OF FEVER. Several different varieties of fever are met with; they may be most conveniently grouped as follows:—

(i.) *Aseptic Traumatic Fever.* When any severe injury has been inflicted, the inflammation necessary for the process of repair is always accompanied by slight febrile disturbance. The temperature goes up for about 24 or 48 hours, reaching its maximum, (rarely exceeding 101°) on the evening of the second day. It then gradually falls and becomes normal by the fourth or fifth day, never lasting beyond a week. This is the variety of fever which occurs in wounds which are aseptic, i.e. free from bacteria or their products. The fever is due in part to reflex nervous disturbance, but chiefly to absorption of fibrin ferment from the leucocytes which disintegrate in the process of inflammation. It has been proved by experiment that fibrin ferment is a pyrogenous material and is capable of producing fever by poisoning the heat-regulating centres. No treatment is necessary.

(ii.) *Septic Traumatic Fever* is the result of absorption of chemical poisons produced in a wound by bacteria. The fever does not run a definite course, but remains just so long as the wound is septic. The amount of fever depends partly on the violence of the poisons produced by the bacteria, but also on the condition of the wound itself. Thus if the latter be well drained, the poisonous materials will tend to run out of the wound instead of into the blood stream ; if, on the contrary,there be inefficient drainage, the poison being pent up under pressure, is readily absorbed. Again, if the wound be lined by a layer of granulations the absorption is much less, as the granulations offer a considerable barrier to the passage of poisonous substances into the circulation. Hundreds of people are walking about every day with foul suppurating ulcers of the leg, yet very few of them have any increase of temperature. Inasmuch as a septic wound always suppurates, septic traumatic fever is often known as *suppurative fever*. When the quantity of poison absorbed is very large, the patient becomes very ill, the temperature rises to 103° or 104° and is often accompanied by a severe rigor. In addition to the usual febrile symptoms, nausea and vomiting, diarrhœa, delirium, collapse and death may occur. This severe form of septic traumatic fever is known as *sapræmia or septic intoxication.*

The treatment consists in rendering the wound aseptic by means of antiseptic applications and supporting the patient's strength by fluid nourishment and stimulants.

Hectic Fever is of the same nature as septic traumatic fever. It occurs in cases of prolonged suppuration when the pus has undergone decomposition and drains away imperfectly. Small quantities of poisonous chemical substances are continually being absorbed into the system. The result is, that the temperature remains almost constantly above the normal, but with well-marked evening exacerbations and morning remissions. The patient gradually wastes away, and dies unless the suppuration is checked by removing the cause.

(iii.) *Infective Fevers* are the result of the absorption of various sorts of parasitic bacteria into the tissues or blood. In some diseases, such as erysipelas, phagedæna, hospital gangrene, actinomycosis, etc., the infection is local, i.e. the surrounding tissues and lymphatic vessels are infected, but not the general blood stream. In others, such as septicæmia, pyæmia, glanders, hydrophobia, tetanus, etc., the infection is general, the bacteria being found in the blood in parts of the body remote from the original site of infection. We must now consider some of these infective diseases in more detail.

ERYSIPELAS,

Erysipelas is a diffuse, spreading inflammation of the skin and subcutaneous tissues. Sometimes it affects mucous membranes. Three varieties are described.

1.—CUTANEOUS ERYSIPELAS always starts from a wound, although sometimes the latter is so small as to escape detection. It appears as a vivid red blush, which spreads very rapidly. The spreading edge is raised and sharply defined, whilst the receding border fades off gradually into the normal skin. The affected skin is œdematous and shiney ; when the subcutaneous tissue is loose as in the eyelids and scrotum, there may be considerable swelling. When the blush starts from an obvious wound the latter usually dries up, ceases to heal, and assumes an unhealthy appearance. The neighbouring lymphatic glands usually become tender and enlarged. These local signs are accompanied by a rigor, a rise of temperature to 103° or 104°, general febrile symptoms and gastro-intestinal disturbance.

Pathology.—The disease is caused by a micrococcus called the *streptococcus erysipelatosus.* This organism may be conveyed to the wound by air or water, by the hands of the surgeon or nurse, by instruments, dressings, etc. Having gained admission to the wound, it infects the neighbouring skin by travelling along the lymphatics. The organisms are not found in the blood. Strong healthy people seldom suffer from erysipelas ; it occurs most frequently in those who are broken down in health, from Bright's disease, alcoholism, and bad hygienic surroundings.

Treatment.—The patient must be isolated lest he infect others. The bowels should be opened by a brisk purge, and perchloride of iron administered in doses of 40 minims every three or four hours. The diet must be liquid but nutritious. Usually, stimulants are indicated, as the febrile symptoms are apt to assume the asthenic type. The affected part should be dusted over with a powder composed of equal parts of oxide of zinc and starch, and covered over with cotton wool.

2.—CELLULO-CUTANEOUS OR PHLEGMONOUS ERYSIPELAS affects the subcutaneous tissue as well as the skin, resulting in much more swelling. Suppuration is very prone to occur, and large pieces of skin may slough. The constitutional symptoms are apt to assume a very asthenic type, and the patient may die from sapræmia, exhaustion, or hectic.

Pathology.—This variety is not nearly so contagious as the cutaneous ; it is caused by local bacterial infection, although, as far as is known, there is no one specific germ producing the disease.

Treatment.—In addition to that already mentioned under the cutaneous variety, numerous incisions should be made into the swollen parts, and a warm, moist, unirritating antiseptic dressing applied.

3.—Cellular Erysipelas, or Diffuse Cellulitis is a diffuse inflammation of the cellular tissue. It may occur in any situation where there is much cellular tissue. The symptoms, pathology and treatment closely resemble the preceeding variety.

PHAGEDÆNA.

This is a very rapid form of spreading ulceration, due to local infection with micrococci. It is usually seen complicating venereal ulcers.

When the phagedænic ulceration is accompanied by sloughing it is called *hospital gangrene*, a condition common in former days when hospitals were overcrowded and badly ventilated, but scarcely ever seen in the present day.

SEPTICÆMIA AND PYÆMIA.

In both these diseases the blood is infected with pathogenic micro-organisms derived from a wound. These two diseases are often indistinguisable clinically, indeed they may occur at the same time in the same patient, and may be complicated by sapræmia or septic intoxication. The chief distinction between them is that in septicæmia the post-mortem appearances are not characteristic, there being only softening and congestion of the internal organs, whereas in pyæmia numerous small collections of pus (*metastatic abscesses*) are found scattered about the body. It is probable that several different kinds of bacteria are capable of producing septicæmia and pyæmia.

The symptoms of septicæmia closely resemble those of sapræmia; the temperature rises suddenly to 103° or 104° and is accompanied by a rigor. The general symptoms of fever are well marked, especially the headache, vomiting, delirium and diarrhœa. Collapse and death frequently occurs, but sometimes the symptoms are less severe and recovery takes place. Septicæmia may be distinguished from sapræmia by the discovery of bacteria in the blood, by appropriate bacteriological methods.

The symptoms of pyæmia may closely resemble those of septicæmia, but in a typical case the rigors are repeated, and the temperature instead of remaining high, undergoes great fluctuations. The temperature goes up to 104° or higher when the rigors occur, and falls again to near the normal, the fall being accompanied by profuse sweating. The febrile symptoms assume the asthenic type and the patient gets into a low typhoid state. When metastatic abscesses occur they produce symptoms referable to the parts affected such as the liver, lungs, joints, etc. Death nearly always occurs.

Pyæmia is especially prone to complicate septic wounds involving the cancellous tissue of bone, the veins of which do not collapse on section, and so offer a suitable portal for the entrance of bacteria into the blood.

The metastatic abscesses of pyæmia are formed in the following way :—The cut ends of the veins in the septic wound become plugged with clot, and the clot becomes impregnated with bacteria, which grow into it from the wound. The clots usually extend as far as the next largest vein in which circulation is still being carried on, hence small portions of clot are apt to become detached and carried along in the blood stream ; eventually they get impacted in some small artery and there the contained bacteria set up inflammation and suppuration.

The curative treatment of septicæmia and pyæmia is very unsatisfactory. Beyond supporting the patient's strength and administering drugs like quinine, salicylic acid, etc, nothing can be done.

British Journal of Dental Science.

LONDON, SEPT. 15th, 1894.

THE DENTAL PUPIL.

The present number of the Journal affords the intending Dental Student all the information he requires in regard to the various requirements of the General Medical Council and the Licensing Bodies. It also gives him the necessary details of the instruction provided by the Schools which work in harmony with the demands made by the before-mentioned Bodies. And yet, in spite of these authentic statements, we expect to receive, from time to time, the usual interrogation from parent, guardian, or student, as to the advisability or possibility of doing this, that, or the other thing. These applications for further enlightenment range, on the one hand, from requests for the name of the particular Latin author to be encountered in some preliminary examination, to enquiries, on the other, as to what medical examinations are now required from the dental student. Some of the questions frequently bear upon that vexed point in dental instruction—the 3 years' apprenticeship in mechanics; as to whether, for instance, it may be taken with a provincial practitioner. It appears to be thought that in the latter case the premium would not be so high, though precisely why this should be, is not altogether clear at first sight. For, presuming that what is required by, and provided for, the pupil is much the same in each case, the amount of time expended in teaching varying only according to the pupil's receptive capability, it would, one is apt to think, have become known by now what is a fair remuneration. The fact, however, is that the teachers' ideas of responsibility and powers of imparting instruction are not cast in a uniform mould. We have before called attention to the laxity of the regulation which merely requires a certificate that the pupilage of three years has been complied with, leaving it optional with those immediately concerned as to the amount of instruction resulting. The fact that at a later period of his career the pupil will be tested at an examination no doubt should, but we are afraid in many cases does not, ensure a conscientious discharge of duty on the part of the registered practitioner who undertakes the responsibility of teaching, and a corresponding determination to learn on the part of the pupil. Dr. Jacob, in writing to *The Freeman*, has endeavoured to show that the apprenticeship should be abolished, and has compared it with the old medical system, which is practically obsolete. He seems to be under the impression that the same subject, dental mechanics, is taught over again during the hospital curriculum, but this is not so. The hospital student certainly does have the benefit of a course of lectures upon the subject, but no systematic practice in manipulation is necessarily provided. Only one of our Dental Schools, we believe, undertakes the three years' training, but we shall be prepared to find that the others will follow the Edinburgh example as time goes on. For the youth who stands on the threshold of the dental profession there is no matter of greater importance than the selection of the right master, and having already said sufficient to draw attention to the matter, we may perhaps be allowed to speculate for a moment as to the future evolution of this particular part of the dentist's training. Whilst there need be no necessity to interfere with the registered practitioner undertaking teaching in his own laboratory, it would appear likely that a re-arrangement of the hospital lectures and diploma examination may come about. Under these circumstances, we may imagine that a course of lectures on Dental Mechanics and the three years' laboratory teaching would be taken before the surgical curriculum was commenced, and that the pupil would be examined once for all in this subject at the end of the pupilage. The dental, and perhaps other organised schools, will probably enter into free competition with the private practitioner; the teaching will become systematised; and the standard of excellence will necessarily be raised.

THE NEMESIS OF PHARMACY.—At the Annual Conference of the Pharmaceutical Society held last month at Oxford, the President, Mr. N. H. MARTIN, in his Address, took the opportunity of pointing out who, in his opinion, was really responsible for the enormous extent to which the sale of proprietary medicines has increased. The sale of these remedies has encouraged the grocers, and other unqualified persons, to cater for the drug consumer, in competition with the registered pharmacist, and has even led to the evolution of the "company pharmacist." Mr. MARTIN thinks the registered men have no one but themselves to blame for this state of things. In their several localities, they have, in the past, by the endorsement of the falsehoods of advertising quacks, created an enormous and unhealthy demand for proprietary medicines about which they can not give, either to physician or to patient, any information based upon their scientific training and experience as pharmacists.

A TRADE OR A PROFESSION.—Mr. MARTIN was equally bold in alluding to the future of Pharmacy, and we were much struck with the comparative definitions which he gave of a trade and of a profession. He thinks that pharmacists are anxious to grasp the commercial advantages of the one whilst also desiring to retain the rewards properly belonging to the other, and that a choice must necessarily be made before long. There is no limit to the extent to which a tradesman may sell goods at the hands of assistants, or intermediate agents between himself and his customer. "The essence of a profession, on the other hand, is that the members of it receive a special education, and give evidence before a legally constituted body that they have been so educated; that the service rendered is personal and direct, and cannot legitimately be multiplied indefinitely through the agency of unqualified persons." Mr. MARTIN is in favour of increasing the stringency of the entrance examination and of having a three years' actual and not nominal apprenticeship.

Dental News.

APPOINTMENT.

Mr. M. Y. Woolf, L.D.S. Eng., has been appointed Dental Surgeon to St. Helena's Home, St. John's Wood.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the "British Journal of Dental Science."

A MODIFIED EXAMINATION.

DEAR SIR,—How quickly some people jump at wrong conclusions! My letter seems to have been misunderstood, I won't say wilfully. If "Correcticus," and "Dental and Conjoint Student," would read my letter, and notice what they did read, they would find no denial of a Modified Examination being in existence. I am perfectly aware of the fact of there being a Modified Examination, which Examination I strongly suspect our friend "Correcticus" has passed. What I suggested in my last was to have a Modified Curriculum—please notice the fact—also a Modified examination based on the above Modified Curriculum, and I am sure such a diploma would carry as much, if not more respect than the *Sine Curriculo* of "Correcticus."

"Dental and Conjoint Student" is perfectly in accord with me; it is to do away with the above *Sine Curriculo* of "Correcticus," and have a better examination. Please note again, I am not "An old Fogey," and do not want to shirk anything. Why I have written at all is because of the raising of the Examination Fee. I am not a referred candidate for the *Sine Curriculo*, and I felt sure that if our Lancashire University, the Senate I mean, were approached in a proper manner, that such a diploma would tend to the betterment of the profession at large. aye, and raise its status, instead of flooding it with *Sine Curriculos.* I may be answered by this: Why not go in for the regular Curriculum? Because being on the Register, and equally qualified to have the same indulgence as any of the Registered men who went in for the L.D.S.I. *Sine Curriculo,* I do not feel disposed to spend six years in gaining a diploma, when others have by means of the above mentioned "Modified Examination" of "Correcticus," crept in at nearly one-third of the fee now demanded. I am a chemist by examination, which examination I look on with as great respect as "Correcticus" does his Modified, and I mean to say that Chemists as a professional body are more nearly allied to the Dental, than the businesses from which a few of the holders of *Sine Curriculo* Diplomas came.

Again, if, as he says, Registered Dentists are unqualified, then why, by all that's just, do the authorities accept the apprenticeship served with a Registered Practitioner. It is hardly good enough, after taking our Registration fees, to want to throw us out, because we do not hold the Modified diploma of "Correcticus." I could a tale unfold of the Surgical skill, aye, and mechanical also, of some of his qualified brethren. Enough for the present. I wish all the success that is possible to be obtained, to my friend "Dental and Conjoint Student."

Thanking you in anticipation,

I am,

Yours, etc.,

"REGISTERED, BUT NON-ADVERTISING DENTIST.

Dental Hospital Reports.

WORK DONE at the Victoria Dental Hospital of Manchester during the month of August, 1894.

Number of Patients attended	909
Number of Extractions	681
Number of Extractions under Anæsthetics	200
Gold Stoppings	25
Other Stoppings	140
Miscellaneous {advice, temporary fillings, scalings, dressings, &c.	154
Crowns	3
Irregularities	4
Total	1207

HERBERT G. ASHBY, *House Dental Surgeon.*

BRITISH JOURNAL OF DENTAL SCIENCE.

DENTAL STUDENTS' SUPPLEMENT. SEPTEMBER 15TH, 1894.

I.—THE LICENSING CORPORATIONS.

Comparative Summary of Regulations for the Licence in Dental Surgery.

	Royal College of Surgeons, England	Royal College of Surgeons, Edinburgh.	Faculty of Physicians and Surgeons, Glasgow.	Royal College of Surgeons, Ireland.
1—PRELIMINARY EXAMINATION....................	Compulsory on all who commenced their Professional Education after July 22nd, 1878. Must be registered as a Dental Student at the office of the General Medical Council, 299, Oxford St., London, W.	Compulsory on all who commenced their Professional Education after July 22, 1878.	Compulsory on all who commenced their Professional Education after August 1st, 1878.	All Examinations in General Education recognised by the General Medical Council.
2—Age at which the Candidate may present himself	Twenty-one.	Twenty-one.	Twenty-one.	Any age, but diploma cannot be granted until he is twenty-one.
3—DURATION OF PROFESSIONAL EDUCATION......	Four years subsequent to registration.	Four years.	Four years.	Four years.
4—COURSES OF LECTURES, &c., to be attended at a recognized School :—				
Anatomy	One course.	One Winter course.	One course of 6 months.	One course.
Physiology	One course.	One course of 6 months.	One course of 6 months.	One course.
Surgery	Ditto.	One Winter course.	Ditto.	Ditto.
Medicine	Ditto.	Ditto.	Ditto.	Ditto.

	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Faculty of Physicians and Surgeons, Glasgow.	Royal College of Surgeons, Ireland.
Chemistry	Instruction.	One Winter course.	One course.	One course.
Materia Medica	Instruction.	One three months' course.	Ditto.	One course.
Dissections and Demonstrations	Twelve months.	Twelve months.	Twelve months.	Two courses.
Practical Chemistry and Metallurgy	Instruction.	One three months' course.	One course.	Three months.
Practice of Surgery	Two Winter Sessions.	One six months' course.	One course of 6 months.	Three months.
Clinical Lectures in Hospital	Two Winter Sessions.	One six months' course.	One course of 6 months.	Nine months.
Dental Anatomy and Physiology	Two courses.	One course.	24 Lectures (Six months.)	One course.
Dental Surgery and Pathology	Ditto.	Ditto.	20 Lectures.	Two courses.
Metallurgy	One course.	...	...	Twelve Lectures.
Dental Mechanics	Two courses.	One course.	Demonstrations.	Two courses.
Practical Instruction in Mechanical Dentistry	Three years under a competent Practitioner, all of which may be previous to Registration.	Three years under a registered Dental Practitioner.	Three years under a Registered Dental Licentiate.	Three Years under a Registered Practitioner.
Practice of Dental Surgery in a recognized Dental Hospital, or in the Dental Department of a recognized General Hospital	Two years.	Two years.	Two years.	Two years.
5—FEE	£10 10s. over and above the stamp duty.	£10 10s.	£10 10s.	£10 10s.
6—LEAST period during which unsuccessful Candidates are referred to their studies	Six months, subject to the decision of the Board.	Three months.	Six months.	Three months.

7—PARTICULARS OF EXAMINATION	(A) *Written:* On General Anatomy and Physiology, General Pathology and Surgery, Dental Anatomy and Physiology, and Dental Pathology and Surgery. (B) *Practical.* (1) On the treatment of Dental Caries, and may be required to prepare and fill cavities with Gold or Plastic filling or material, or to do any other operation in Dental Surgery. (Candidates must provide their own instruments.) (2) On the Mechanical and Surgical treatment of the various irregularities of children's teeth. (3) On Mechanical Dentistry. (C) *Oral.* Comprises the several subjects included in the curriculum of professional education, and is conducted by the use of preparations, casts, drawings, &c.	*Written and Oral:* First Part—Anatomy, Chemistry, Physiology. Second Part—Surgery, Medicine, Therapeutics, and special subjects, of Dental Anatomy and Physiology, Dental Surgery, & Pathology, and Dental Mechanics. Registered Medical Practitioners are examined on the special subjects only. Practical Examination given in Dental Surgery, Pathology & Mechanics.	*Written, Oral & Practical:* 1st part—Anatomy, Physiology, Chemistry, and Metallurgy. Second Part—Surgery, Medicine, Materia Medica, and special Dental subjects. Practical Examination at a Dental Hospital. Candidates are to bring Excavator, Files, and Plugging Instruments.	*Written and Oral* On all the subjects of the Curriculum. Preparations, Microscopes, and other appliances. SINE CURRICULO:— Candidates in practic before July, 1878, an whose names are on a Den tal Register are admittec to the examination *Sin Curriculo.*
8—DATES OF EXAMINATIONS	May and November.	First examination.— Tuesday, April 30, 1895, Monday, July 22, 1895. Second exam. on Thursday following.	1894 October 4—6. 1895 May 1—3.	Feb. May & Nov.
For further information apply to	MR. F. G. HALLETT, Examination Hall, Victoria Embankment, London, W.	JAS. ROBERTSON, Solicitor, Clerk of College, 1, George Square, Edin.	ALEX DUNCAN, Esq., Faculty of Physicians and Surgeons, Glasgow.	The Registrar, Royal College of Surgeons, Dublin.

II. PRELIMINARY EXAMINATION.

REGULATIONS OF GENERAL MEDICAL COUNCIL.

No person shall be allowed to be registered as a Medical or Dental Student unless he shall have previously passed (at one or more Examinations) a preliminary Examination in the subjects of General Education as specified in the following List:—

⁂ Regulations in operation from January 1, 1892.

(a) English Language, including Grammar and Composition.
(b) Latin, including Grammar, Translation from specified authors, and translation of easy passages not taken from such authors.
(c) Mathematics, comprising (*a*) Arithmetic; (*b*) Algebra, as far as Simple Equations, inclusive; (*c*) Geometry, the subject matter of Euclid, Books I., II., and III., with easy deductions.
(d) One of the following optional subjects:—
  (*a*) Greek, (*b*) French, (*c*) German, (*d*) Italian, (*e*) any other Modern Language (*f*) Logic.

List of Examining Bodies whose Examinations fulfil the conditions of the Medical Council as regards Preliminary Education, and entitle to registration as Medical or Dental Students.

I. UNIVERSITIES IN THE UNITED KINGDOM.

UNIVERSITY OF OXFORD:—

1. Junior Local Examinations; Certificate to include Latin and Mathematics, and also one of the following optional subjects, Greek, French, German.
2. Senior Local Examinations; Certificate to include Latin and Mathematics.
3. Responsions.
4. Moderations.
5. Examinations for a degree in Arts.

UNIVERSITY OF CAMBRIDGE:—

6. Junior Local Examinations: Certificates to include Latin and Mathematics, and also one of the following optional subjects:—Greek, French, German.
7. Senior Local Examinations; Certificate to include Latin and Mathematics.
8. Higher Local Examinations.
9. Previous Examination.
10. Examination for a Degree in Arts.

⁂ The Council will not in future accept any Certificate of pass in Preliminary Examination in General Education, unless the whole of the subjects included in the Preliminary Examination required by the Council for Registration of Students of Dentistry have been passed at the same time; but this rule shall not apply to those who, previous to January 1, 1892, have passed a part of any Preliminary Examination recognized by the Council.

Provided that a University Examination required for graduation in Arts, wherein the specified subjects of General Education are included, may be recognized for the purpose of registration.

UNIVERSITY OF DURHAM:—

11. Examination for Certificate of Proficiency.
12. Examination for Students at the end of their first year.
13. Examination for a Degree in Arts.

UNIVERSITY OF LONDON:—

14. Matriculation Examination.
15. Preliminary Scientific (M.B.) Examination.
16. Examination for a Degree in Arts or Science.

VICTORIA UNIVERSITY:—

17. Preliminary Examination; Latin to be one of the subjects.
18. Entrance Examination in Arts, to include all the subjects required.

UNIVERSITY OF EDINBURGH:—

19. Local Examinations (Junior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects:—Greek, French, German.
20. Local Examination (Senior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects:—Greek, French, German.
21. Preliminary Examination for graduation in Science or Medicine and Surgery.
22. Examination for a Degree in Arts.

UNIVERSITY OF ABERDEEN:—

23. Local Examinations (Junior Certificate); Certificate to include all the subjects required.
24. Local Examinations (Senior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects:—Greek, French, German.
25. Preliminary Examination for graduation in Medicine and Surgery.
26. Examination for a Degree in Arts.

UNIVERSITY OF GLASGOW:

27. Local Examinations (Junior Certificate); Certificate to include all the subjects required.
28. Local Examinations (Senior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following subjects:—Greek, French, German.
29. Preliminary Examination for graduation in Medicine or Surgery.
30. Examination for a Degree in Arts.

UNIVERSITY OF ST. ANDREWS:—

31. Local Examination (Senior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects:—Greek, French, German.
32. Local Examinations (Junior Certificate); to include all the subjects required.
33. Preliminary Examination for graduation in Medicine or Surgery.
34. Examination for a Degree in Arts.

University of Dublin.

35. Public Entrance Examination.
36. General Examination at end of Senior Freshman year.
37. Examination for a Degree in Arts.

Royal University of Ireland :—

38. Matriculation Examination.

Oxford and Cambridge Schools' Examination Board :—

39. Certificate, to include the following subjects, an adequate knowledge of English Grammar and Orthography, as shown in the course of the Examination, to the satisfaction of the Examiners, being held as conforming to the requirements of the Medical Council in regard to those subjects:
(*a*) Arithmetic, including Vulgar and Decimal Fractions;
(*b*) Algebra, including Simple Equations;
(*c*) Geometry, including the first two books of Euclid;
(*d*) Latin, including Translation and Grammar;
(*e*) Also one of these optional subjects, (Greek, or any Modern Language or Logic.)

II.—OTHER BODIES NAMED IN SCHEDULE (A) TO THE "MEDICAL ACT."

*Apothecaries' Society of London :—

40. Examination of Arts.

Royal Colleges of Physicians and Surgeons of Edinburgh :—

41. Preliminary (combined) Examination in General Education.

Faculty of Physicians and Surgeons of Glasgow :—

42. Preliminary Examination in General Education.

*Royal Colleges of Physicians and Surgeons in Ireland.—

43. Preliminary Examination; Certificate to include Mathematics.

III.—EXAMINING BODIES IN THE UNITED KINGDOM NOT INCLUDED IN SCHEDULE (A) TO THE "MEDICAL ACT" (1858).

College of Preceptors :—

44. Examination for a First Class Certificate, or Second Class Certificate of First or Second Division, Algebra, Geometry, Latin, and either a Modern Language, or Greek, or Logic, having been taken.
45. Preliminary Examination for Dental Students.

Intermediate Education Board of Ireland :—

46. Junior Grade Examination
47. Middle Grade Examination
48. Senior Grade Examination

} Certificate in each case to include all the subjects required.

Educational Institute of Scotland :—

49. Preliminary Medical Examination.

Scotch Educational Department :—

50. Leaving Certificates in each Grade and in Honours.

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* The Council has recommended that these Examinations be discontinued.

IV.—INDIAN, COLONIAL, AND FOREIGN UNIVERSITIES AND COLLEGES.

REGISTRATION OF DENTAL STUDENTS.

Every Dental Student shall be registered in the manner hereinafter prescribed by the General Medical Council.

No Dental Student shall be registered until he has passed a Preliminary Examination, as required by the General Medical Council, and has produced evidence that he has commenced Dental Study.

The commencement of the course of Professional Study recognised by any of the Qualifying Bodies shall not be reckoned as dating earlier than fifteen days before the date of Registration.

Every person desirous of being registered as a Student shall apply to the Branch Registrar of the division of the United Kingdom in which he is residing, according to the prescribed form, which may be had on application to the several Qualifying Bodies, Dental Schools, and Hospitals; and shall produce or forward to the Branch Registrar a Certificate of his having passed a Preliminary Examination, as required by the General Medical Council, and evidence that he has commenced Dental Study.

Students who commenced their professional education by apprenticeship to Dentists entitled to be registered, or by attendance upon professional lectures before July 22nd, 1878, (when Dental Education became compulsory,) shall not be required to produce evidence of having passed a Preliminary Examination.

Candidates for a Diploma in Dental Surgery shall produce certificates of having been engaged during four years in Professional Studies, and of having received three years' instruction in Mechanical Dentistry from a registered Practitioner.

One year's *bona fide* apprenticeship with a registered Dental Practitioner, after being registered as a Dental Student, may be counted as one of the four years of professional Study.

The three years of instruction in Mechanical Dentistry, or any part of them, may be taken by the Dental Student either before or after his registration as a Student; but no years of such mechanical instruction shall be counted as one of the four years of Professional Study unless taken after registration.

III. EDUCATIONAL BODIES.

LONDON.

DENTAL HOSPITAL OF LONDON, AND LONDON SCHOOL OF DENTAL SURGERY,

LEICESTER SQUARE.

DENTAL AND MEDICAL OFFICERS.

Consulting Physician:—

Sir Richard Quain, Bart., F.R.S., M.D., F.R.C.P., LL.D.
Consulting Surgeon—Christopher Heath, F.R.C.S.

Consulting Dental Surgeons:—

Sir John Tomes, F.R.S., F.R.C.S., L.D.S.;
T. Arnold Rogers, M.R.C.S., L.D.S.

Dental Surgeons.

9 a.m.—Monday ... C. F. Truman, M.A.Cantab., M.R.C.S., L.D.S.
,, Tuesday ... R. H. Woodhouse, M.R.C.S., L.D.S., L.S.A.
,, Wednesday E. Lloyd Williams, M.R.C.S., L.R.C.P., L.D.S., L.S.A.
,, Thursday... Storer Bennett, L.R.C.P., F.R.C.S., L.D.S.
,, Friday ... W. Hern, M.R.C.S., L.D.S.
,, Saturday L. Matheson, L.D.S.

Assistant Dental Surgeons.

,, Monday ... J. F. Colyer, M.R.C.S., L.R.C.P., L.D.S.
,, Tuesday ... W. B. Paterson, F.R.C.S., L.D.S.
,, Wednesday Percy J. Smith, M.R.C.S., L.R.C.P., L.D.S.
,, Thursday... C. F. Rilot, M.R.C.S., L.D.S.
,, Friday ... H. Baldwin, M.R.C.S., L.D.S.
,, Saturday... H. Lloyd Williams, M.R.C.S., L.D.S.

FOR THE AFTERNOONS.

1.30 p.m.—Monday ... A. Clayton Woodhouse, M.R.C.S., L.D.S.
,, Tuesday ... W. H. Dolamore, M.R.C.S., L.R.C.P., L.D.S.
,, Wednesday F. J. Bennett, M.R.C.S., L.D.S.
,, Thursday... W. H. Woodruff, L.D.S.
,, Friday ... C. Robbins, L.D.S.

Anæsthetists.

9.30 a.m— Tuesday ... Frederic Hewitt, B.A., M.D. Cantab.
,, Thursday... Carter Braine, F.R.C.S.
,, Friday ... W. Dudley Buxton, M.D., B.S. Lond, M.R.C.P. Lond.
,, Saturday... G. H. Bailey, M.R.C.S.

Assistant Anæsthetists.

9.30 a.m.—Monday .. E. A. Bridger, M.D.
2.0 p.m—Monday ... George Rowell, F.R.C.S.
9.30 a.m.—Wednesday Henry Davis, M.R.C.S., L.S.A.
2.0 p.m.—Wednesday E. A. Bridger, M.D.
,, Tues., Thurs., Fri.—B. H. Comerford, M.R.C.S., L.R.C.P.

Demonstrators.

T. H. CLARENCE, L.D.S.
A. B. DENSHAM, M.R.C.S., L.R.C.P., L.D.S.
E. GARDNER, L.D.S.
W. H. MAY. L.D S.

Medical Tutor—W. H. DOLAMORE, M.R.C.S., L.R.C.P., L.D.S.

Curator of Mechanical Laboratory.

A. J. WATTS, L.D.S.I.

8 *House Surgeons and* 3 *Assistant House Surgeons attend daily.*

Demonstrations.—Demonstrations will be given every morning during the early part of each Session; and at the end of the Course those Gentlemen who have attended the Demonstrations to the satisfaction of the Staff, will be permitted to perform operations at the Hospital under the supervision of the Medical Officers and the House Surgeon.

Dresserships for Cases of Extraction.—The appointments are held for one month, and consist of six senior Dresserships for extractions under anæsthetics and eighteen Junior Dresserships for ordinary extractions.

The Senior Dressers will be selected from those pupils only who have entered fully both to the practice and lectures of this Hospital, and also to the Course required by the College of Surgeons for the Licence in Dental Surgery at one of the General Hospitals.

A new Mechanical Laboratory has been fitted up and opened in which Demonstrations are given by the Lecturer on Mechanical Dentistry, on Continuous Gum Work, Making Obturators, aud the Mechanical Treatment of Acquired and Congenital Cleft Palate, Pivoting, Bridge and Bar Work, &c., and the Students are enabled to make plates for the treatment of Irregularities and of Cleft Palate.

The Hospital is lighted throughout by electricity. The New Mechanical Laboratory is now open. The Laboratory is carefully fitted with all the requirements of a modern Dental Laboratory, and is lighted with Electric Light for foggy weather. Each bench is also well lighted by daylight. The workroom is under the superintendence of A. J. WATTS, L.D.S.I., who will attend daily from 9 a.m. to 6 p.m. to give practical instructions to students.

The WINTER SESSION will commence on October 1st, 1894.
The SUMMER SESSION will commence in May, 1895.

LECTURES.

Dental Surgery and Pathology.—Mr. STORER BENNETT.
Dental Anatomy and Physiology (*Human and Comparative*).—Mr. ARTHUR UNDERWOOD.
Mechanics of Dentistry.—Mr. DAVID HEPBURN.
Metallurgy in its application to Dental Purposes.—Dr. FORSTER MORLEY.

MEDICAL TUTOR.

The Medical Tutor attends four days in the week, from 5 to 7 p.m., for two months previous to the Annual Examinations. His classes are open to all Students, and are intended to assist those who are preparing for their examinations at the College of Surgeons; generally speaking, to guide and direct the studies of the pupils, and prepare them in the subjects for the Examinations.

FEES.

Fee for the Special Lectures and Hospital Practice required by the Curriculum, £50 in one payment, or 50 Guineas when paid in two yearly instalments.

An extra fee of seven guineas will be payable for every extra six months' Hospital Practice.
All fees are payable on day of entry.

FEES FOR SINGLE COURSES.

	£	s.	d.
Dental Anatomy and Physiology, One Course	5	5	0
,, ,, Two Courses	8	8	0
Dental Surgery, One Course	5	5	0
,, Two Courses	8	8	0
Dental Mechanics, One Course	5	5	0
,, Two Courses	8	8	0
Metallurgy, One Course	5	5	0
,, Two Courses	8	8	0

Qualified Medical Men or Gentlemen holding Foreign Diplomas to practise in their native country, can receive six months' practical instruction in the Hospital, fee 20 guineas.

The Medical Committee reserve to themselves the right to refuse any such candidates' application.

Students who perform Operations for Filling Teeth must provide their own Instruments for the same, the proximate cost of which is £25; a list can be had on application, but "The Kit" has been very carefully selected with a view to efficiency, and is well adapted for use in future practice.

Further particulars may be obtained on application to the Dean, who attends at the Hospital every Wednesday from 10 a.m. to 12 noon.

PRIZES.

The Prize-day is held in July.

1. A Scholarship of the value of £20 has been founded by Sir Edwin Saunders, and will be awarded at the close of each Summer Session.

2. Prizes are awarded by the Lecturer for the best examinations in the subjects in their respective courses, at the end of the Summer and Winter Sessions.

3. Prize in Operative Dentistry, in the competition for which each candidate is entrusted with the care of a mouth, which he shall, if not impracticable, set thoroughly in order.

4. A prize of the value of five guineas is also given by Messrs. Ash & Sons for the best essay on a surgical subject connected with the mouth.

Note.—The Medical Committee have resolved "that the holder of the Saunders Scholarship be admitted without additional fee to the extra year of Hospital Practice."

The Dean requests that all communications relating to the Medical School may be addressed to him at the Hospital, where he will attend in the afternoons, from Sept. 26th to Oct. 2nd inclusive, from 5 till 6 o'clock, or on Wednesday mornings from 10.30 till 12.

MORTON SMALE, M.R.C.S., L.D.S., M.S.A., *Dean.*

NATIONAL DENTAL HOSPITAL AND COLLEGE, GREAT PORTLAND STREET, W.

FOUNDED 1861.

HOSPITAL STAFF.

Consulting Physicians.

Sir W. H. Broadbent, Bart., M.D., F.R.C.P.
Sir B. W. Richardson, M.A., M.D., F.R.S.

Consulting Surgeons.

Sir Spencer Wells, Bart., F.R.C.S. Christopher Heath, F.R.C.S.

Consulting Dental Surgeon.

Sir Edwin Saunders, F.R.C.S.

Hon. Visiting Physician.

James Maughan, M.D.

Hon. Visiting Surgeon.

E. W. Roughton, F.R.C.S., &c.

Dental Surgeons.

Monday	...	F. Henri Weiss, L.D.S., Eng.
Tuesday	...	Alfred Smith, L.D.S., Eng.
Wednesday	...	Marcus Davis, L.D.S., Eng.
Thursday	...	A. F. Canton, L.D.S., Eng.
Friday	...	H. G. Read, M.R.C.S., L.R.C.P., L.D.S. Eng.
Saturday	...	C. W. Glassington, M.R.C.S., L.D.S. Edin.

Assistant Dental Surgeons.

Monday	...	Willoughby Weiss, L.D.S., Eng.
Tuesday	...	Sidney Spokes, M.R.C.S., L.D.S., Eng.
Wednesday	...	Edgar Beverley, L.D.S., Eng.
Thursday	...	T. G. Read, L.D.S., Eng. D.M.D.
Friday	...	W. Rushton, L.D.S., Eng.
Saturday	...	Sibley W. Read, L.D.S. Eng.

Anæsthetists.

Monday	...	C. H. Cozens, M.R.C.S., L.R.C.P.
Tuesday	...	W. Reid Holmes, M.D., M.C.
Wednesday	...	C. J. Ogle, M.R.C.S., L.S.A.
Thursday	...	G. Everitt Norton, M.R.C.S., L.S.A.
Friday	...	James Maughan, M.D.
Saturday	...	Harold Low, M.A., M.B. Camb.

Demonstrator.

J. W. Pare, M.D. Edin., L.D.S. Eng.

House Surgeon.

Reginald E. Nicholls, L.D.S. Eng.

LECTURERS.—(Winter Session.)

Dental Anatomy and Physiology	Sidney Spokes, M.R.C.S., L.D.S., Eng.
Dental Mechanics	Harry Rose, L.D.S., Eng.
Dental Metallurgy	W. Lapraik, Ph.D., F.I.C., F.C.S.
Operative Dental Surgery ...	George Cunningham, M.A., L.D.S., Eng. D.M.D.
Dental Materia Medica	C. W. Glassington, M.R.C.S., L.D.S. Edin.

At present the Hospital is open for the reception of patients every week-day, from 9 o'clock till 11 o'clock a.m. Work is continued till 2 o'clock p.m. and a proposal to open the hospital in the afternoon is under consideration.

The accommodation and fittings are in accordance with the latest requirements for efficient teaching in all branches of the Science and Art of Dental Surgery.

The Conservation Room, with space for sixty chairs, is well lighted and warmed and ventilated after approved methods.

Other large rooms are arranged as a Mechanical Laboratory, Special Demonstration Room, Students' Common Room, &c.

There are also a Metallurgical Laboratory, Library and Museum. The Waiting Rooms, Extraction Rooms and Lecture Hall are on the ground floor.

The building is lighted throughout by electricity, and there is also a current for motors in the Stopping Room.

Each Student on entering the School passes through a preliminary course under the care of a Demonstrator, and all the members of the Staff take part in chair-side teaching.

Dresserships in the Extraction Rooms.

These appointments are re-arranged every two months. The respective dressers for each day are required to be in attendance from 9 o'clock till the conclusion of the practice ; and they will be under the direction of the Dental Surgeons of the day, and of the House Surgeon.

The stopping rooms have accommodation for 60 chairs, and are well lighted warmed and ventilated.

Clinical Lectures and Demonstrations.

Each medical officer will give clinical lectures, when opportune, during the ensuing year. Clinical lectures will also be given from time to time on cases of special interest ; and also demonstrations upon the preparing and filling of cavities and other operations upon the teeth and contiguous parts.

The Hon. Visiting Physician and Surgeon give Demonstrations weekly, on cases of Oral Surgery, Anæsthetics, Cardiac, and Pulmonary lesions, and a member of the anæsthetic staff gives a course of lectures.

Attendance and Examination of Students.

A register is kept of the attendance of students at the Hospital Practice and lectures. An attendance of full two years at Hospital practice is required by the College of Surgeons of England ; and no schedule will be signed for any lectures of which less than two-thirds have been attended. Class examinations are held frequently during the several courses, to test the progress and attention of the pupils ; and at the end of each course of lectures a written examination is held. An insufficient attendance at lectures disqualifies the student for receiving any prize of that year.

Tutorial classes are held to prepare for the final examinations, students who have, at this school, complied with the Dental portion of the Curriculum.

LECTURES.

WINTER SESSION, COMMENCING ON MONDAY, OCT. 1st, 1894.

Dental Anatomy and Physiology, by Sidney Spokes, M.R.C.S., L.D.S. Eng. On Tuesdays and Thursdays, at 5 p.m., during October, November, and December.

Operative Dental Surgery, by George Cunningham, M.A., D.M.D., L.D.S. Eng. On Mondays, at 6.30 p.m., during October, November and December, (Free to Students of the Hospital and College.)

Dental Materia Medica and Therapeutics, by Charles W. Glassington, M.R.C.S., L.D.S., Edin. On Tuesdays, at 7.30 p.m. during October, November and December. (Free to Students of the College.)

Dental Metallurgy, by W. Lapraik, Ph. D., F.I.C., F.C.S. On Tuesdays, at 7.30 p.m., during January, February, and March.

Dental Mechanics, by Harry Rose. L.D.S. Eng. On Mondays at 7 p.m., during January, February and March.

Demonstrations on Dental Mechanics, by W. Robinson Humby, L.D.S. Eng. On Wednesdays, at 7 p.m., during January, February, and March. (Free to Students of the College.)

Summer Session, 1895.

Dental Surgery and Pathology, by Willoughby Weiss, L.D.S. Eng. On Mondays and Thursdays, at 6 p.m., during May, June, and July.

Elements of Histology, by James Maughan, M.D., L.R.C.P., M.R.C.S. On Mondays and Thursdays, at 5 p.m., during May, June, and July. (Free to students of the College.)

FEES.

General Fee for Special Lectures required by the Curriculum of the Royal College of Surgeons of England: £15 15s.

Fees to single Courses.	One Course.	Two Courses.
Dental Anatomy and Physiology	£2 12 6	£4 4 0
Dental Surgery and Pathology	2 12 6	4 4 0
Dental Mechanics	2 12 6	4 4 0
Dental Metallurgy	3 3 0	5 5 0
*Operative Dental Surgery	2 12 6	
*Dental Materia Medica	2 2 0	
*Elements of Histology	1 1 0	
*Demonstrations on Dental Mechanics	1 1 0	

Total Fee for the Special Lectures and Hospital Practice required by the Curriculum, £31 10s.

Fee for the two years' Hospital Practice required by the Curriculum, £15 15s.

⁂ This scale of Fees comes into force after Oct. 1st, 1894.

PRIZES.

An Entrance Exhibition of the value of £15 is open for competition at the commencement of each Summer and Winter Session, after an Examination in the following Subjects:—

Elementary Physics (Statics, Dynamics and Electricity). Examiner—W. H. Coffin, Memb. Phys. Soc. and Inst. Elect. Engineers.

Physiology. (The Functions of Respiration, Circulation and Digestion.) Examiner—James Maughan, M.D.

Osteology. (Bones of the head.) Examiner—E. W. Roughton, F.R.C.S.

Chemistry. Examiner—Wm. Lapraik, Ph.D., F.I.C., F.C.S.

Dental Mechanics. (Theoretical and Practical). Examiners—Harry Rose, L.D.S. Eng., W. R. Humby, L.D.S., Eng.

Six Prizes in Medals, are open for competition among the students of the Colleges, at the end of each Course of Lectures, on the following subjects, viz.. Dental Anatomy, Dental Surgery, Dental Mechanics, Metallurgy, Operative Dental Surgery, and Dental Materia Medica.

Certificates of Honour will be awarded to those Students who show superior proficiency in any of the classes.

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* These Lectures are free to Students who have fully entered for the Special Lectures.

The Rymer Gold Medal for General Proficiency, value £5, will be awarded annually to the most distinguished Student of the year. His general conduct and attendance must have been in every respect satisfactory. At the time of the special examination for the Rymer Medal, the Student must not hold any qualification. The Medal will be awarded on the understanding that the Student completes the Dental Curriculum.

The Ash Prize, value £3 3s. in cash for the best Thesis on a subject in Dental Surgery.

The Dean attends the Hospital on Tuesday mornings.

The public Distribution of Prizes will take place during the Winter Session.

SIDNEY SPOKES, *Dean.*

GUY'S HOSPITAL DENTAL SCHOOL.

Dental Surgeon.—F. NEWLAND-PEDLEY, F.R.C.S., L.D.S. Eng.
Senior Assistant Dental Surgeon—W. A. MAGGS, L.R.C.P., M.R.C.S., L.D.S.E.

FEES.

The fee for the two years' Hospital Practice, required by the Royal College of Surgeons for the L.D.S., including lectures, is £50. Dental Students are also required to receive two years' instruction in a General Hospital, the fee for which in Guy's Hospital Medical School is £60, with a reduction of 12 guineas in the case of those students who have obtained certificates of instruction in Chemistry, Practical Chemistry, and Materia Medica. No arrangements are made for short periods of Instruction, or special Courses of Lectures.

THE VICTORIA DENTAL HOSPITAL OF MANCHESTER, DEVONSHIRE STREET, ALL SAINTS.

Consulting Physicians:
HENRY SIMPSON, M.D., M.R.C.S. | D. J. LEECH, M.D., F.R.C.P.

Consulting Surgeons:
E. LUND, F.R.C.S. | T. JONES, F.R.C.S.
F. A. HEATH, M.R.C.S. | J. HARDIE, F.R.C.S.

Consulting Dental Surgeons.
H. CAMPION, M.R.C.S. | G. W. SMITH, M.R.C.S.

Dental Surgeons.

Monday Morning	I. RENSHAW, L.D.S.I.; D. HEADRIDGE, L.D.S. Eng.
Monday Evening	W. HEADRIDGE, L.D.S.I.; L. DRESCHFELD, L.D.S.I.
Tuesday Morning	T. TANNER, L.D.S. Eng.; G. O. WHITTAKER, L.D.S. Eng.
Wednesday Morning	P. A. LINNELL, L.D.S. Eng.; F. W. MINSHALL, L.D.S.I.
Wednesday Evening	W. A. HOOTON, L.D.S. Eng.; C. R. MORLEY, L.D.S. Eng.
Thursday Morning ...	W. DOUGAN, L.D.S.I.; E. P. COLLETT, L.D.S. Eng.
Friday Morning ...	G. G. CAMPION, L.D.S. Eng.; W. SIMMS, L.D.S.I.
Friday Evening ...	W. DYKES, L.D.S. Glas.; C. H. SMALE, L.D.S., Eng.
Saturday Morning	J. W. DUNKERLEY, L.D.S.I.; W. SMITHARD, L.D.S.I.

Administrators of Anæsthetics.

Monday Morning ... ... Alexander Wilson, F.R.C.S.
Wednesday Morning ... ... J. Prince Stallard, M.B.
Saturday Morning ... ... Alexander Wilson, F.R.C.S.

Demonstrator.

T. E. Sherratt, L.D.S.Eng.

House Dental Surgeon.

H. G. Ashby, L.D.S., Eng.

Preliminary Instruction.

During the first six months at the Hospital, new students are taken by the Demonstrator through a very complete course of practical instruction in all branches of operative dentistry. This course includes the actual preparation and filling of cavities out of, and in the mouth, the treatment of the different pathological conditions of the dental pulp, the treatment and filling of root canals, and the different methods of crowning.

A special course of demonstrations is given to more advanced students by the Lecturer on Operative Dentistry, and other demonstrations are given periodically by the dental staff.

Prizes.—The Fletcher prizes are awarded twice annually—in January and July. They consist of a first prize, value £8, for second year's men, and a second prize, value £2, for first year's men. The Matheson Operating Prize, value £3 3s. A prize, value £2 2s. is given by Messrs. Ash & Sons for the best essay on some subject in general surgery in connection with the teeth. This prize is awarded in July. Two prizes, value one guinea and two guineas are offered respectively to first and second year's men, for proficiency in the extraction of teeth. A prize, value 2 guineas, for the best Regulating Case treated during the year.

FEES.—The Fee for the 2 years' Dental Hospital Practice required by the College of Surgeons of England is £12 12s., which must be paid in advance.

A prospectus containing full information may be had on application to—

GEORGE G. CAMPION, Dean.

THE OWENS COLLEGE, MANCHESTER.

DENTAL DEPARTMENT.

PROFESSORS AND LECTURERS.

Anatomy, Descriptive and Practical—Professor Alfred H. Young, M.B., F.R.C.S.
Physiology—Brackenbury Professor Wm. Stirling, M.D., D.Sc.
Chemistry—Professor Harold B. Dixon, M.A., F.R.S.
Organic Chemistry—Professor W. H. Perkin, Ph. D., F.R.S.
Materia Medica and Therapeutics—Professor D. J. Leech, M.D., F.R.C.P.
Medicine—Professor J. Dreschfeld, M.D., F.R.C.P.
Surgery—Professor Thomas Jones, M.B., F.R.C.S.
Clinical Surgery—Professor Walter Whitehead, F.R.C.S.E., F.R.S.E.
Dental Surgery—Lecturer, G. G. Campion, L.D.S.
Operative Dentistry—Lecturer, G. O. Whittaker, L.D.S.
Dental Anatomy and Physiology—Lecturer, W. A. Hooten, L.D.S., L.R.C.P., M.R.C.S.
Dental Mechanics—Lecturer, Thomas Tanner, L.D.S.
Dental Metallurgy—Lecturer, C. A. Burghardt, Ph. D.
Dental Pathology and Histology—Demonstrator, David Headridge, L.D.S

The Dental Department forms an integral part of the Department of Medicine, and with the Manchester Royal Infirmary and the Victoria Dental Hospital affords the fullest opportunities for study to students preparing for any of the Dental Examinations.

In addition to the ordinary Dental Lectures required by the Licensing Bodies, a course on Operative Dentistry is given during the Summer Session, and these are supplemented by a series of Practical Demonstrations given by the Lecturer at the Victoria Dental Hospital.

There is also a special Course of Demonstrations in Dental Histology and Pathology, in which Students are enabled to mount for themselves Microscopic Specimens illustrating these subjects.

PRIZES.—Prizes or Medals and Certificates are awarded in all the classes on the results of the several examinations.

Special Prizes are also awarded at the Victoria Dental Hospital.

The WINTER SESSION commences on October 2nd.

Prospectuses will be forwarded on application.

H. W. HOLDER, M.A., Registrar.

LIVERPOOL.

DENTAL HOSPITAL, MOUNT PLEASANT.

Consulting Physician—THOMAS ROBINSON GLYNN, M.D., M.R.C.P., Lond.

Consulting Surgeon—FRANK T. PAUL, F.R C.S., Eng.

Consulting Dental Surgeons.

C. ALDER, L.D.S.
H. C. QUINBY, L.D.S., D.D.S.
W. H. WAITE, L.D.S., D.D.S.

Honorary Dental Surgeons.

R. M. CAPON, L.D.S., Glasgow.
R. H. BATES, L.D.S., Eng.
E. A. COUNCELL, L.D.S., Eng.
R. EDWARDS, M.R.C.S., L.D S., Eng.
FREDERICK ROSE, L.D.S , Eng.
W. MAPPLEBECK, L.D.S.I.
THOS. MANSELL, L D S., Edin.
E A. MANSELL, L.D.S., Eng.
W. J. PIDGEON, L.D.S., Eng.
J. ROYSTON, L.D.S., Eng.
M. ALEXANDER, L.D.S.I.
T. COYSH, L.D.S., Eng.

Honorary Demonstrator of Operative Dental Surgery.

J. P. ROBERTS, L.D.S.

Honorary Anæsthetist.—J. G. GEMMELL, M.B., C.M.

Stipendiary Dental Surgeon.
LEWIS OSBORN, L.D.S., Eng.

Dean—R. EDWARDS, M.R.C.S., L.D.S., Eng.

This Hospital is a school of Practical Dental Surgery, duly recognised by the Royal College of Surgeons, and open to all Students of Dentistry, under such regulations as shall be determined by the Committee of Management.

The Hospital is open, daily, for the admission of patients from 9 till 11 a.m., and from 6. 30 to 8 p.m., except on Saturday.

Fees for Hospital Practice. £12 12s. for two years' Hospital Practice required for the curriculum. £15 15s. perpetual.

Further information may be obtained by applying to the Dean.

BIRMINGHAM.

MASON COLLEGE, (WITH QUEEN'S FACULTY OF MEDICINE.)

Principal ... ... Professor R. S. HEATH, M.A., D.Sc.
Dean of the Queen's Faculty ... Professor WINDLE, M.A., M.D., D.Sc.

DENTAL DEPARTMENT.

Professors and Lecturers.

Anatomy—Professor BERTRAM C. A. WINDLE, M.A., M.D., D.Sc.
Physiology—Professor F. J. ALLEN, M.A., M.B.
Chemistry—Professor PERCY F. FRANKLAND, Ph.D., B.Sc., F.R S.
Chemical Physics—Professor J. H. POYNTING, D.Sc., F.R.S.
Medicine { Professor C. W. SUCKLING, M.D., M.R.C.P.
  Professor R. SAUNDBY, M.D., F.R.C.P.
Surgery { Professor BENNETT MAY, B.S., F.R.C.S.
  Professor G. BARLING, B.S., F.R.C.S.
Materia Medica—JOHN BARCLAY, B.Sc.
Dental Surgery—F. HUXLEY, M.R.C.S., L.D.S.
Dental Anatomy—J. HUMPHREYS, L,D.S.I., F.L.S.
Dental Mechanics—F. H. GOFFE, L.D.S.
Dental Metallurgy { Professor FRANKLAND
  W. G. MACMILLAN, F.I.C.
Surgical Diseases of the Mouth—F. MARSH, F.R.C.S.
Medical Diseases of the Mouth—STACEY WILSON, M.D., M.R.C.P.

Demonstrators.

Operative Dental Surgery—W. T. MADIN, L.D.S.
Mechanical Dentistry—F. R. HOWARD, L.D.S.
Dental Pathology—J. D. WHITTLES, L.D.S.

Special Courses

Of Lectures for Dental Students will be delivered on—

i. Syphilis and Surgical Diseases of the Mouth in their relation to Dentistry, by Frank Marsh, F.R.C.S., Surgeon to the Queen's Hospital.

ii. Diseases of the Mouth and of Digestion in their relation to Dentistry, by T. Stacey Wilson, M.D., M.R.C.P., Physician to the General Hospital.

The Department, in conjunction with the Dental, the General, and the Queen's Hospitals, provides the entire course of instruction required for the Diplomas in Dental Surgery of the Royal Colleges of Surgeons.

The College possesses a well equipped Dental Museum and Laboratory. An Entrance Scholarship, Medals, and Certificates in the classes are offered annually. There are special courses on Syphilis and Surgical Diseases of the Mouth, on Diseases of the Mouth and Stomach in relation to Dentistry, and on Practical Dental Microscopy. At the Dental Hospital, particular stress is laid upon the teaching of all latest methods of conservative Dentistry, including the various modes of Gold Filling, and Crown and Bridge work.

For prospectuses, and further information, application should be made to JOHN HUMPHREYS, Esq., L.D.S.I., F.L.S. Hon. Sec., to the Department, 22, Newhall Street, or to

GEO. H. MORLEY, REGISTRAR.

BIRMINGHAM DENTAL HOSPITAL,

71, Newhall Street.

Open Daily at Nine a.m.

Hon. Consulting Physician— Robert M. Simon, M.D.

Hon. Consulting Surgeon—John St. S. Wilders, M.R.C.S.

Hon. Consulting Dentists :

Adams Parker, L.D.S.
Charles Sims, L,D.S.

Hon. Administrators of Anæsthetics:

S. W. Haynes, M.B,
J. Henry Blakeney, M.R.C.S.
Chas.St.Johnston,M.R.C.S.,L.R C.P·
Cyril Hutchinson, M.R.C.S.
T. Sydney Short, M.B.
—Pooler, M.R.C.S.

Hon. Dental Surgeons :

H. Breward Neale, L.D.S.
F. E. Huxley, M.R.C.S., L.D.S.
F. H. Goffe, L.D.S.
J. Humphreys, L.D.S.
F. W. Richards, L.D.S.
A. E. Donagan, B.A., L.D.S.

Hon. Assistant Dental Surgeons :

W. R. Roberts, L.D.S.
F. R. Howard, L.D S.
J. E. Parrott, L.D.S.
W. T. Madin, L.D.S.
J. Mountford, L.D.S.
P. T. Naden, L.D.S.

House Surgeon :
S. Haines, L.D S.

Demonstrator:
A. J. Hilder, L.D.S.

DEMONSTRATIONS.

Clinical Demonstrations will be given from time to time by the Staff on cases of particular interest; also daily upon the preparing and filling of cavities, the insertion of porcelain inlays, pivoting teeth, adapting porcelain and metal crowns to broken down teeth.

The Demonstrators attend four days a week to instruct the Students. New Students are taken through a complete course for three months in the first principles of operative dentistry.

Dental Students are required to register their names for Hospital Practice with the Honorary Surgical Secretary, Mr F. W. Richards, 27, Paradise Street, from whom further information may be obtained.

DEVON AND EXETER DENTAL HOSPITAL, EXETER.

Consulting Surgeons.
A. J. Cumming, F.R.C.S. Eng.
James Bankart, M.B., Lond., F.R.C.S. Eng.

Consulting Dental Surgeon.
S. Bevan Fox, L.D.S. Eng.

Dental Surgeons.
J. T. Browne-Mason, L.D S. Eng.
Henry Biging Mason, L.D.S. Eng.
T. G. T. Garland, L.D.S.I.
J. M. Ackland, M.R.C.S., L D.S. Eng.
S. Mundell, L.D.S. Eng.
J. A. Mallet, L.D.S. Eng.

Surgeon Administrators of Anæsthetics.

JOHN MORTIMER, M.B. Lond., M.R.C.S. Eng.	RUSSELL COOMBE, M.A. Cantab., F.R.C.S. Eng.

Honorary Secretary.
HENRY YEO.

Attendance on the practice of this Hospital is recognised by the Royal College of Surgeons of England as qualifying for their Dental Diploma.

The Hospital is open daily (Sundays excepted), and patients are admitted between the hours of 9 and 11 a.m.

Pupils or any member of the Staff or other registered Practitioner (being a Life or Annual Governor) are permitted to attend the Practice of the Hospital, subject to the approval of the Medical Sub-Committee, on payment of Five Guineas annually to the Funds of the Institution. Students attending the practice of the Hospital must consider themselves strictly under the control of the Medical Officers, and must not undertake any operation without the consent of the Dental Surgeon for the day.

Number of cases treated in 1893, 5,299.

PLYMOUTH DENTAL HOSPITAL,

BANK STREET CHAMBERS, BANK STREET, PLYMOUTH.

The Dentists attend each day, at 9 a.m. except Sundays.

Certificates of attendance on the practice of this Dental Hospital are recognized by the College of Surgeons as qualifying for the Diploma in Dental Surgery. The College also recognizes the lectures delivered at the Hospital.

Pupils of any of the Dental Surgeons of the Plymouth Dental Hospital, or other Dentists holding a Diploma of the College of Surgeons, or Members of the Odontological Society, may attend the Hospital on the day of such practitioner as may agree to accept such pupils,on the payment of £1 1s. per annum to the institution.

A Course of Lectures will—if a sufficient number of Students present themselves—be delivered during the year.

On "Dental Physiology, Dental Anatomy, Dental Mechanics."
Fee to Lectures, one Course, £7 7s.
Fee to Lectures, double Course, £12 12s. (required for Diploma.)
Fee to Dental Practice at Hospital £5 5s. per annum.
Fee to entire Dental Curriculum (required for Diploma) 22 guineas.

E. A. BENNETT, Hon. Sec. and Treasurer.

EDINBURGH.

INCORPORATED EDINBURGH DENTAL HOSPITAL AND SCHOOLS.

Consulting Physician—ALEX. PEDDIE, M.D., F.R.C.P.E.
Consulting Surgeon—JOSEPH BELL, M.D., F.R.C.S.E.
Consulting Dental Surgeon—JOHN SMITH, M.D., F.R.C.S.E.
Dean—W. BOWMAN MACLEOD, L.D.S.

Dental Surgeons.

ANDREW WILSON, L.D.S., Edin.	J. STEWART DURWARD, L.D.S., Ed.
MALCOLM MACGREGOR, L.D.S., Edin.	JAMES MACKINTOSH.
GEORGE WATSON, L.D.S., Edin.	WILLIAM FORRESTER.

Assistant Dental Surgeons.

JOHN S. AMOORE, L.D.S., Eng.	JOHN TURNER, L.D.S., Edin.
J. GRAHAM MUNRO, L.D.S. Edin.	DAVID MUNRO, L.D.S., Edin.
FRED PAGE, L.D.S.	THOMAS GREGORY, L.D.S.

Extra Assistant Dental Surgeons.

R. NASMYTH HANNAH, L.D.S.	J. BAILLIE WILSON, L.D.S.

SEWILL SIMMONS, L.D.S.

Chloroformists.

W. BASIL ORR, M.D.	MATHESON CULLEN, M.B., C.M.
W. LUNDIE, M.B., C.M.	J. M. FARQUHARSON, M.B., C.M.

Tutorial Dental Surgeon.

ROBERT LINDSAY, L.D.S.

DENTAL SCHOOL.

LECTURES.

Dental Anatomy and Physiology (Human and Comparative) by ANDREW WILSON, L.D.S.—These Lectures will be delivered on the evenings of Tuesday and Friday, at 8 o'clock, commencing October, 1894. The Course consisting of twenty-four Lectures, will be illustrated by preparations, models, diagrams, microscopical specimens, etc.

Dental Surgery and Pathology, by GEORGE W. WATSON, L.D.S.—These Lectures will be delivered on the mornings of Tuesday and Friday at 8 o'clock, during the Summer Session, commencing May, 1895. The course, consisting of twenty-four Lectures, will be illustrated by preparations, models, diagrams, microscopical preparations, etc.

Mechanical Dentistry, by W. BOWMAN MACLEOD, L.D.S. The Lectures will commence November, 1894, at 8 p.m., and be continued every Wednesday thereafter till the Course of at least twelve Lectures is concluded.

In connection with the above a course of Lectures on Metallurgy will be given by FORBES WATSON, B.Sc., F.G.S.

Practical Mechanics.—Assistant Demonstrators, J. STEWART DURWARD, L.D.S., J. GRAHAM MUNROE. L.D.S.—In addition to the Systematic Lectures, there will be given during the Session, Demonstrations on Dental Mechanics, and each Student will be expected to prepare the mouth, take the impression, make the denture, and insert the same in at least four cases. Special facilities are afforded in the Mechanical Department; a large and fully equipped workroom under the charge and direction of a competent mechanic, having been set aside for the construction of dental appliances. The Demonstrations will be spread over the two years of Hospital practice, and will be given as occasion serves. Students will be required to furnish their own hand tools.

Extra course of Lectures, Dental Materia Medica and Therapeutics, by WM. GUY, F.R.C.S., L.R.C.P., L.D.S. Gold Fillings, H. BYCROFT EZARD, L.D.S.

In the various classes prizes will be offered for competition.

General Fee for the Hospital Practice and special Lectures required by the Curriculum.—Hospital Practice, £15 15s. One Course each of Denta Anatomy, Dental Surgery, and Mechanical Dentistry, £9 15s—£25 10s

Fees to separate Classes.—Dental Anatomy, Dental Surgery, Mechanical Dentistry, £3 5s. each.

The Hospital Practice and Lectures qualify for the Dental Diploma of the Royal College of Surgeons, Edinburgh, and also for the other Licensing Bodies. Second Courses of the Lectures as required by the Royal College of Surgeons of England, £2 4s.

For further information apply to the Dean, who will be found at the Hospital every Thursday morning between 9 and 10 o'clock.

THE SESSION 1894-5 OPENS OCTOBER 2nd, 1894.

General Fee for the Hospital Practice and special Lectures required by the Curriculum.

Hospital Practice, Two Years	£15	15	0
One Course of 24 Lectures in Dental Anatomy	9	15	0
,, 22 ,, ,, Surgery			
,, 12 ,, ,, Mechanics			
Total	£25	10	0

For further particulars, apply to the Dean, 5, Lauriston Lane, Edinburgh.

GLASGOW.

DENTAL HOSPITAL AND SCHOOL,

4, CHATHAM PLACE, STIRLING ROAD.

The Hospital is open daily except Saturday and Sunday, from 5 p.m. till 7 p.m.

The work of the Hospital is conducted as far as possible, by the Students, under the supervision of the Dental Officer of the day. Cases of special interest will be made the subject of clinical instruction or demonstration as they occur.

The practice of the Hospital may be entered upon at any time during the Session and attendance dated therefrom. Fee for the two years' practice required by the Curriculum, £15 15s. Fee for each course of Lectures, £3 3s.

DENTAL SCHOOL.

Dental Anatomy and Physiology, Human and Comparative, by W. WALLACE, M.A., M.B., L.D.S.

The Lectures will be delivered in the Summer Session, on the evenings of Tuesdays and Fridays, at 7 p.m., and will be illustrated by Diagrams, Preparations, and Microscopic Specimens. Text Book—Tomes, Manual of Dental Anatomy, Human and Comparative.

Dental Surgery and Pathology, by REES PRICE, L.D.S. Eng., M.R.C.S.

These Lectures are delivered on Tuesdays and Thursdays during the months of May and June, at 8 a.m., and will be illustrated by recent Specimens, and other Preparations and Drawings, &c. Text-books—Tomes, Manual of Dental Surgery; Salter's Dental Pathology and Surgery.

Mechanical Dentistry, by J. A. BIGGS, L.D.S.

This course will commence on the first Tuesday of November at 7 p.m., and will consist of 12 Lectures, with Practical Demonstrations in Dental Laboratory.

All communications on matters relating to the Dental School should be addressed to D. M. ALEXANDER, Solicitor, 97, West Regent Street, Glasgow, who will forward detailed Prospectus of the School.

SCHOOL OF MEDICINE, EDINBURGH.

The Fees required for students attending general subjects necessary for the curriculum of the Royal College of Surgeons, Edinburgh, are the same as those for the Conjoint Examining Board, as Candidates for the L.R.C.S.E. require to be in possession of a recognised Diploma in Medicine.

The Secretary of the School is Mr. R. N. Ramsay, 24, Forest Road, Edinburgh, from whom the official Calendar may be had gratis.

DENTAL HOSPITAL OF IRELAND,

25, LINCOLN PLACE, DUBLIN.

The Winter Session will commence on Monday, October 1st, 1894.

The Summer Session will commence in May, 1895.

Consulting Physicians:

F. R. Cruise, M.D.
John W. Moore, M.D.

Consulting Surgeons :

E. H. Bennett, F.R.C.S.I.
Sir W Stokes, F.R.C.S.I.

Consulting Dental Surgeons :

R. H. Moore, F.R.C.S.I.
Daniel Corbett, M.R.C.S.E., L.D.S. Eng.

Dental Surgeons :

Robert Hazelton, F.R.C.S.I.,
W. Booth Pearsall, F.R.C.S.I.
R. Theodore Stack, M.D., F.R.C.S.I., D.M.D. (Harv.) L.D.S. Eng.
A. W. W. Baker, M.D., F.R.C.S.I., L.D.S.I.
Daniel Corbett, Jr., A.B, F.R.C.S.I.,
G. W. Yeates, M.B., Ch M., L.D.S.I.
G. M. P. Murray, F.R.C.S.I.

Assistant Dental Surgeons.

J. S. Thomson, L.D.S., Ed.
Shenstone Bishop, L.D.S.I.

Anæsthetists.

J.G.Cronyn, L.R.C S.I., K.L.Q.C.P.I.
W.R.Graves, L.R.C.S.I., L.K.Q.C.P.I
James B. Coleman, M.B., Ch.M., R.U.I.

Pathologist—William Mallet Purser, M.D.

Registrar—William A. Shea.

In connection with the Dental Hospital of Ireland, the Dental School will be open for the Winter Session on October 1st, 1894.

All Dental Students who have passed their Preliminary Examination are admissible to the Clinical Instruction of the Hospital, after paying Fees and subscribing to the conditions prescribed by the Staff.

In addition to Clinical Instruction, Courses of Lectures and Demonstrations will be given at the Hospital in Dental Surgery and Pathology, Mechanical Dentistry, the Administration of Anæsthetics, crowns, pivots, porcelain inlays, gold fillings, regulating plates, &c.

The Lectures on Dental Surgery and Mechanical Dentistry will be given during the winter, those in Dental Anatomy and Metallurgy during the summer months.

In addition to the longer courses of Hospital attendance, special courses of three months' duration, will be given to Surgeons about to join the Army and Navy, or to practise in the Colonies or remote country districts.

Regulations as to Fees and other conditions can be obtained from the Registrar of the Hospital, or from

R. Theodore Stack, Dean.

COOKE'S SCHOOL.

This School is recognised by the London University, the Apothecaries' Hall, and other Examining Bodies, and offers somewhat special advantages to such as aim at combining the Dental and Medical Curricula with economy as to time and expense. Through the School being open for Anatomical work, not only during the winter months, but also during the summer months, extra time is obtained which would admit of the Dental and Medical Curricula being taken conjointly in something like the time usually allotted to either. The License of the Apothecaries' Hall admits to the Examination for the L.D.S. of Edinburgh and Dublin. Passing the Examination in Anatomy and Physiology at the Apothecaries' Hall further admits in the direction of purely Medical Examinations, to the final Examination for the Triple Qualification of Edinburgh and Glasgow, (License of the Royal Colleges of Physicians and Surgeons of Edinburgh), and License of the Faculty of Physicians and Surgeons of Glasgow). It is not intended to take on at Cooke's School more than a limited number of men, *who must be steady and earnest workers.* For such, however, exceptional advantages are offered in regard to thoroughly practical work in Anatomy and Physiology. The School also affords ample opportunities for additional work in preparation for the various examinations: dissecting room well supplied with dissected parts, &c., &c. For further information apply to Dr. Thomas Cooke, F.R.C.S., 40, Brunswick Sq., W.C.

IV. GENERAL HOSPITALS.

CHARING CROSS HOSPITAL.

Dental Surgeon—J. F. COLYER, M.R.C.S., L.R.C.P., L.D.S., who attends at the Hospital, two days a week, at 9 a.m.. for Dental Operations. A course of Lectures on Dental Surgery is also given during January, February, and March, and Tutorial classes three days each week throughout the year by Mr. COLYER.

Students may serve as assistants to the Dental Surgeon for a period of three months.

The composition fee for dental students is 54 guineas, or 60 guineas, payable in two instalments of 30 guineas each.

A proportionate reduction of the above fees will be made to those students who have completed part of the curriculum at a recognized institution.

The hours of lectures have been specially arranged to suit the convenience of dental students. Charing-cross Hospital is within three minutes' walk of the Dental Hospital of London.

For further information apply to the Dean, Mr. Stanley Boyd, or to the Librarian and Secretary, Mr. J. Francis Pink, at the office of the Medical School, Chandos Street, Charing-cross, between the hours of 10 and 4.

LONDON HOSPITAL AND MEDICAL COLLEGE.

Dental Surgeon—Ashley Barrett, M.B. Lond. M.R.C.S., L.D.S.

The Council of the College of Surgeons recognize the Dental Department of the London Hospital as a school at which may be obtained the Dental Practice necessary to qualify a student for the Examination of the Dental Diploma. Dental Students may obtain the General Medical Education (that is, apart from certain special Lectures to be attended at a Dental School) and the Dental Practice necessary for the Diploma, at the London Hospital School, on payment of Forty Guineas.

A course of Lectures on the Anatomy and Pathology of the Teeth and Dental Surgery will be delivered by Mr. Ashley Barrett, on days which will be duly announced. It comprises the treatment of dental irregularities, of Dental Caries and such matters in connection with the subject as are of interest to the Medical Practitioner. Mr. Barrett gives practical instruction on Tuesdays at 9 a.m., which is open to all students of the School and can be attended by gentlemen who are not pupils on payment of a fee of Ten Guineas.

In addition to the Lectures a series of Demonstrations of the simpler modes of filling teeth will be given during the month of June. The Demonstrations will refer to the modes of Manipulating Amalgam and Gutta Percha fillings, the preparation of Cavities, the filling of Teeth containing vital and dead pulps, the mode of relieving pain after filling, and the instruments needed for these operations.

A Dental Assistant is elected every three months, without any additional expense. The terms of the office date from the first Tuesday in January, April, July and October. In selecting Candidates, priority will be given to those who have attended the greatest number of Lectures on Dental Pathology and Surgery, and have also been the most punctual in attendance in the Dental Department on Tuesday morning.

Further information may be obtained on application to Mr. Munro Scott, the Warden, Medical College, London Hospital.

KING'S COLLEGE, STRAND, W.C.

Special arrangements are made for Dental Students. Apply to the Dean

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MIDDLESEX HOSPITAL.

Consulting Dental Surgeons—Sir J. Tomes, F.R.S., F.R.C.S., L.D.S.
J. S. Turner, M.R.C.S., L.D.S.

Dental Surgeon—W. Storer Bennett, F.R.C.S., L.R.C.P., L.D.S.

Assistant Dental Surgeon—W. Hern, M.R.C.S., L.D.S.

In 1887 the acquisition of a site in Cleveland Street enabled a much needed extension of the Buildings to be carried out. The additions included an additional Lecture Theatre, a physiological Laboratory and Class Room, a

Students' Room, and a Luncheon Room. A new and commodious Library and a Materia Medica Museum have also been opened.

Students who intend to become Licentiates in Dental Surgery of the Royal College of Surgeons are admitted to attend the requisite courses of Lectures—which are arranged to fit in with the work at the Dental Hospitals—and Hospital Practice on payment of a fee of 54 guineas, in one payment, or by instalments of £42 on entrance, and £21 at the beginning of the Second Winter Session.

A short course of Lectures on Dental Surgery will be delivered during November and December by the Lecturer on Dental Surgery, Mr. Storer Bennett. The Lectures will be supplemented by practical Demonstrations, which will be given every week during the Winter and Summer Sessions by the Dental Surgeon and Assistant Dental Surgeon. Students of the Hospital free, others pay a fee of 2 guineas.

Further information may be obtained from Sidney Coupland, M.D., the Dean, or from the Resident Medical Officer at the Hospital.

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.

Dental Surgeons—MR. PATERSON, MR. ACKERY.

Assistant Dental Surgeons—MR. READ, MR. ACKLAND.

The Dental Department of the Hospital is open on Tuesday and Friday mornings at 9 o'clock. The practice of the department is recognised by the Royal College of Surgeons.

The fee for general subjects for Dental Students for the first winter is £33 2s. 6d., for the first summer £33 2s. 6d., or a single payment of £66 3s.

ST. GEORGE'S HOSPITAL.

Dental Surgeon—H. L. ALBERT, M.R.C.S.

Mr. Albert attends at the Hospital on Mondays and Fridays at 12 noon; his assistant on Tuesdays and Saturdays, at 1 p.m.

A course of Lectures on Dental Surgery is given by Mr. Albert in the Summer Session. Free to Students of the Hospital.

Fees for general subjects in Dental Surgery, exclusive of Practical Chemistry, £55. Payable in two instalments: first year, £30; second year, £25.

Further information can be obtained by application to Dr. ISAMBARD OWEN, Dean of the Medical School.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.

Dental Surgeon—MORTON SMALE, M.R.C.S., L.D.S.

Practical instruction in Dental Operations is given on Wednesdays and Saturdays at 9 a.m. Dressers are appointed who hold office for three months.

For prospectuses and further information apply to the School Secretary, Mr. FREDERIC H. MADDEN.

GEORGE P. FIELD, Dean of the School.

ST. THOMAS'S HOSPITAL.

Dental Surgeon—CHARLES EDWIN TRUMAN, M.A. Cantab, M.R.C.S., L.D.S.

Assistant Dental Surgeon—Vacant.

Gentlemen may receive instruction in diseases of the teeth, are appointed dressers, and can undertake operations, subject to the supervision of the Dental Surgeons, Tuesdays and Fridays at 10 a.m.

Numerous cases of irregularity of the teeth, and the application of artificial appliances, are undertaken during the term.

The fee for attendance on the *general* subjects required of the students in Dental Surgery, is, for the two years, £65, or by instalments, £55 for the first year, and £15 for the second year.

UNIVERSITY COLLEGE HOSPITAL.

Dental Surgeon—SIDNEY SPOKES, M.R.C.S., L.D.S.

Mr. Spokes attends at the Hospital on Tuesdays and Fridays, at 9.30 a.m. and delivers a Course of Lectures on Fridays at 5 p.m., during the months of November and December.

At University College a material reduction in the fees is made for students who are entered at a recognised Dental Hospital. For those who do not require Chemistry and Materia Medica, there is a Composition Fee of 50 guineas.

WESTMINSTER HOSPITAL.

Consulting Dental Surgeon—J. WALKER, M.D., M.R.C.S., L.D.S.

Dental Surgeons—C. W. GLASSINGTON, M.R.C.S., L.D.S., & E. GARDNER, L.D.S.

Dental Department.

The Dental Surgeons, Mr. Glassington and Mr. Gardner, attend at 9.15 a.m. on Wednesdays and Saturdays respectively.

Mr. Glassington attends at 9.15 a.m. on Wednesdays, and Saturdays for practical demonstration of diseases and operations of the teeth.

The fee for attendance on the Dental Practice is £2 2s. for three months, and £3 3s., for six months. The whole of the General Lectures and Surgical

Practice required for the Dental Diploma of the College of Surgeons can be attended for 50 guineas in one sum on entrance, or for two sums of £30, and £26 payable at the beginning of each year.

Mr. Glassington will give a series of Demonstrations on Dental Surgery and Pathology, to meet the requirements of the general student of Medicine, at an hour to be determined at the commencement of the Session.

A Scholarship value £20 is offered annually in September for Competition to commencing Dental Students.

HARVARD UNIVERSITY DENTAL DEPARTMENT, BOSTON, MASS., U.S.A.

The Sessions of this School begin the last Thursday in September, and end the last Wednesday in June, making nine months of practically continuous work in each year.

General Anatomy, with Dissections, Physiology, and General Chemistry, are the studies of the first year. Of the second year they are Operative and Mechanical Dentistry, Materia Medica and Therapeutics, Oral Anatomy and Physiology, Bacteriology, and Surgical Pathology. Of the third year Operative and Mechanical Dentistry, Crown and Bridge work, and Orthodontia. The Student can also attend gratuitously all the *lectures* in any other department in the University.

The Infirmary furnishes abundant facilities, averaging 8,000 operations, of which a large proportion consists of filling teeth, every year.

The University degree D.M.D. (Dentariæ Medicinæ Doctor) is conferred on all who fulfil the requirements.

For the first year a student is a member of the school the fee is 200 dols.; for the second year, 150 dols., and for any subsequent year, 50 dols.

For further information and announcements, address, Thomas H. Chandler, Dean, 161, Newbury Street, Back Bay, Boston, Mass., U.S.A.

THE DENTAL COLLEGE OF THE UNIVERSITY OF MICHIGAN.

The Annual Session of this Institution will commence on the 1st of October, and close on the last Thursday of June, thus making a course of nine months. A preliminary examination, having reference to general education attainments, is required.

The Student in this department will receive instructions in Anatomy, Physiology, Pathology, Chemistry, Materia Medica, Therapeutics, Surgery, and Hygiene, from the professors of their respective branches in the *Departments of Medicine and Surgery* of the University, when lectures commence and continue the same as with the Dental College.

Special instructions will be given in Dental Pathology, Oral Surgery, Dental Therapeutics, and diseases of Women and Children, with reference to the teeth.

FEES AND EXPENSES.

The fees, which must be paid in advance, are as follows:

RESIDENTS OF MICHIGAN.—Matriculation, 10.00 dols. Annual dues, 25.00 dols.

NON-RESIDENTS.—Matriculation, 25.00 dols. Annual dues, 35.00 dols.

For the various Laboratories, 35.00 dols.

GRADUATION FEE.—For all alike, 10.00 dols. The matriculation fee is paid but once, and entitles the student to the privilege of permanent membership in any department of the University. The Annual due is paid the first year and every year thereafter while at the University.

V. SCIENTIFIC ASSOCIATIONS.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN, 40, LEICESTER SQUARE, W.C.

Officers for 1894-95.

President—Frederick Canton.

Vice-Presidents :

Resident.	Non-Resident.
R. H. Woodhouse.	F. H. Balkwill, (Plymouth.)
Ashley Gibbings.	W. E. Harding, (Shrewsbury.)
A. W. Barrett.	George Henry, (Hastings.)

Treasurer—S. J. Hutchinson.

Librarian—W. A. Maggs. *Curator*—Storer Bennett.

Editor of the Transactions—E. Lloyd Williams.

Honorary Secretaries.

C. Robbins (Council), J. F. Colyer (Society),
C. Woodhouse, (For Foreign Correspondence.)

Councillors.

Resident.	Non-Resident.
J. Ackery.	C. H. Quinby (Liverpool.)
A. Underwood.	D. W. Amoore (St. Leonards.)
H. Rose.	Wilson Hogue (Bournemouth.)
C. D. Davis	G. G. Campion (Manchester.)
C. E. Truman.	J. McKno Ackland (Exeter.)
W. R. Humby.	J. H. McCall (Leicester.)
W. B. Paterson.	T. Arkovy (Budapest.)
H. Baldwin.	A. W. W. Baker (Dublin)
J. Gartley.	F. E. Huxley (Birmingham.)

Extract from the Bye-Laws.

Objects and Constitution of the Society.

The Society is instituted for the encouragement and diffusion of knowledge in Dental Surgery, and for the promotion of intercourse among Members of the Dental Profession.

The Society shall consist of Resident, Non-Resident, Corresponding, and Honorary Members.*

1. The Resident Members shall consist of gentlemen residing or practising wholly or partly in London or within ten miles of the General Post Office, St. Martin's-le-Grand.
2. The Non-Resident Members shall consist of gentlemen wholly practising beyond ten miles from the General Post Office.
3. The Corresponding Members shall consist of distinguished gentlemen residing in the Colonies of Great Britain or in Foreign Countries.
4. The Honorary Members shall consist of distinguished Practitioners of Dental Surgery who have retired from practice, of distinguished Medical Practitioners, and of gentlemen distinguished in any department of Science.

Persons who advertise in the public journals, or by circular, either their profession or their professional attainments or public appointments, or anything relating to their mode of practice or charges, or who expose for public inspection specimens of operative or mechanical Dentistry, or conduct their practice in any way which in the opinion of the Council of this Society, is derogatory to the respectability of the Profession, shall not be considered eligible for nomination as members.

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* Candidates for the Resident, Non-Resident, or Corresponding Membership of the Society shall not be eligible unless they practise as Dental Surgeons, or are interested in the progress of Dental Surgery, and are also Licentiates in Dental Surgery, or qualified Practitioners of Medicine or Surgery: or possess such a Diploma or Degree as in the opinion of the Council, will qualify them for the Membership of the Society.

No person being the proprietor of a secret remedy, or holding a patent relating to the requirements of Dental Practice, shall be a member of this Society.

Election and Admission of Resident and Non-Resident Members.

Candidates for Resident Membership shall be recommended by four or more Members, two at least signing from personal knowledge. Candidates for Non-Resident Membership shall be recommended by three members, one at least signing from personal knowledge.

All recommendations for resident or non-resident members shall be submitted to, and approved of, by the Council, before being proposed to the Society for ballot.

Contributions of Members.

Every person elected a Resident Member shall pay Three Guineas as an Admission Fee and an Annual Subscription of Two Guineas, *in advance.*

Every person elected a Non-Resident Member shall pay Two Guineas as an Admission Fee and an Annual Subscription of One Guinea in advance.

The Entrance Fees and First Annual Subscriptions shall be paid on admission, and the subsequent Annual Subscriptions in the month of November in each year; but new members proposed at or after the January Meeting, shall not be required to pay any Subscription for the current Session.

Ordinary Meetings.

The Ordinary Meetings of the Society shall be held on the first Monday in each month, from November to June, both inclusive, at 8 p.m. precisely, except in the month of January, or when an Act of Parliament holiday occurs on that day, the meeting shall be held on the Monday next ensuing.

Each Member may introduce two Visitors at these Meetings on writing the Visitors' names in a book to be kept for that purpose. The same Visitors will not be admitted more than three times during one Session.

Annual General Meeting.

The Annual General Meeting of the Society for the election of the Officers and Councillors, &c., shall be held on the evening of the first Monday in June every year.

Society's Transactions.

The Transactions of the Society, under the designation of "Transactions of the Odontological Society of Great Britain," shall be printed at such times and in such manner as the Council shall direct.

The "Transactions" shall be presented to all Resident and Non-Resident members of the Society who have paid their Annual Subscriptions.

ODONTO-CHIRURGICAL SOCIETY OF SCOTLAND,

5, Lauriston Lane, Edinburgh.

President—Mr. Walter Campbell, L.D.S.

Vice-Presidents.

Mr. J. Stewart Durward, L.D.S. | Mr. A. A. deLessert, L.D.S.

Treasurer—Mr. John S. Amoore, L.D.S.

Secretary—Mr. Herbert B. Ezard. L.D.S., 32, Buccleuch Place. Edinburgh.

Curator and Librarian—J. Graham Munro, L.D.S.

Andrew Wilson, L.D.S. | W. Bowman Macleod, L.D.S.
G. W. Watson, L.D.S. | P. S. Walker.

Ordinary Meetings.—The Society meets on the second Thursdays of November, December, January, February and March.

Extracts from the Constitution and Laws.

Name and Objects.

The Society shall be named the "Odonto-Chirurgical Society," and shall have for its objects the Promotion and Diffusion of Knowledge in matters connected with Dental Surgery; the furtherance of communications on such subjects by members of the Society; and otherwise to advance the interests of Dental Surgery as a branch of Medicine.

Ordinary and Honorary Members.

The Society shall consist of Ordinary, Honorary, and Corresponding Members.

(*A*.) Ordinary Members. Gentlemen shall be eligible for Ordinary Membership who hold the Licentiate in Dental Surgery of any of the Licensing Bodies of Great Britain or Ireland, or a Colonial or Foreign qualification recognised by the General Medical Council, entitling them to practise dentistry in Great Britain.

(*B*.) Honorary Members. Gentlemen (practising or retired) who hold a qualification recognised by the General Medical Council, or Foreign or Colonial Dentists holding a qualification recognised in their own country, who may have distinguished themselves in the practice of, or in connection with Dentistry, and Medical or Scientific men who may have distinguished themselves in connection with Dentistry, shall be eligible as Honorary Members.

(*C*.) Corresponding Members. Gentlemen resident in the Colonies or Foreign Countries, holding qualifications recognised in their respective countries shall be eligible as Corresponding Members.

The Ordinary Members shall have vested in them the Government of the Society, and all cases not otherwise specified shall be decided by them by a majority of votes by ballot if required.

Obligations of Members.

No member shall be permitted to advertise his profession, his modes of practice, or his charges, either in the public journals or by circular. They shall not be permitted to expose specimens of their work for public inspection, nor to carry on their practice in connection with any other business, nor to hold any patent relating to Dental practice, nor to conduct themselves in any way which the Society may consider derogatory to the Profession, so long as they continue members of the Society. But members who practise in towns other than that in which they reside, shall be allowed to intimate their visits; such intimations being subject to the approval of the Council.

Applications for Membership.

Candidates for admission as Members of the Society shall be recommended by an Ordinary Member, and the recommendation seconded by another. After being approved by the Council, such recommendation shall be read to the Society at an Ordinary Meeting, and shall lie over to the next, when the Candidate shall be balloted for, when two-thirds of the Members present must be in his favour to secure his election.

Contributions.

Ordinary Members residing within a ten-mile radius of the City shall pay an Entrance Fee of One Guinea, and One Guinea of an Annual Subscription in advance. All other Ordinary Members shall pay an Entrance Fee of One Guinea, and Ten Shillings and Sixpence of an Annual Subscription. All Annual Subscriptions to date from the 1st March preceding the Candidate's admission.

NORTH OF ENGLAND ODONTOLOGICAL SOCIETY, NEWCASTLE-ON-TYNE.

President—Mr. J. A. Fothergill, M.R.C.S., L.D.S. Eng., D.D.S., Penn.

Vice-Presidents:

Mr. Warwick Hele, L.D.S. Eng.
Mr. R. L. Markham, L.D.S.I.

Hon. Treasurer—Mr. W. G. Routledge, L.D.S. Edin.

Hon. Secretaries:

Mr. J. T. Jameson, L.D.S. Edin., 4, Ridley Place.
Mr. W. D. Moon, L.D.S. Eng., 8, Jesmond Road.

Council:

Mr. C. F. Sutcliffe, L.D.S.I.
Mr. A. E. Knowles.
Mr. S. Brown.
Mr. R. A. Turnbull, L.D.S.I.
Mr. W. J. Mason, L.D.S. Edin.
Mr. W. Sommerville-Woodiwis, L.D.S. Edin.

Extract from Laws.

The Society shall have for its objects the diffusion of knowledge, and the promotion of intercourse among Dentists, and the advancement of the general interests of the Dental Profession.

The Society shall consist of Ordinary and Honorary members:—

The Ordinary Members shall consist of gentlemen who are practising or have practised as dentists, and are registered under the Dentists' Act of 1878.

Obligation of Members.

Members shall not be permitted to advertise in the public journals, or by circulars, either their professional attainments, or public appointments, or anything relating to their modes of practice or charges: or to expose for public inspection specimens of operative or mechanical dentistry, or conduct their practices in any way which in the opinion of the Council is derogatory to the Profession.

Application for Membership.

Candidates for admission as Members shall be recommended by one Member from personal knowledge, and by one Member from general knowledge.

Meetings.

The Ordinary Meetings will be held in Newcastle-on-Tyne, on the second Wednesday of each of the months, from October to March inclusive, at 6.30 p.m.

Contributions.

Members shall pay an Entrance Fee of five shillings on admission, and an annual subscription of half a guinea in advance.

THE BRITISH DENTAL ASSOCIATION,

(*Incorporated June* 3rd, 1880,)

40, LEICESTER SQUARE, LONDON.

President—C. S. Tomes, F.R.S., M.A. Oxon., M.R.C.S., L.D.S.

Vice-Presidents.

Sir Edwin Saunders, F.R.C S.
Dr. John Smith, F.R.C.S., Edin.
Sir John Tomes, F.R.S., F.R.C.S. L.D.S., Eng.
J. Smith Turner, M.R.C.S., L.D.S. Eng.

Treasurer—W. H. Woodruff, L.D.S., Eng.

Honorary Secretary—W. B. Paterson, F.R.C.S., L.D.S. Eng.

Extracts from Memorandum of Association and Bye-laws.

The objects for which the Association is established are the promotion of Dental and the allied Sciences, and the maintenance of the honour and the interests of the Dental Profession by

"The Periodical meetings of the Members of the Association and the Dental profession generally, in different parts of the country.

"The publication of a periodical journal, and by

"The maintenance of the spirit and provisions of the Dentists' Act, by such lawful means as may be necessary, &c., &c."

Extracts from the Bye-laws.

A person who is registered in the Dentists' Register shall be eligible for election as a member of the Association, provided that he be of good character; that he does not conduct his practice by means of the exhibition of Dental specimens, appliances, or apparatus in an open shop, or in a window, or in a showcase exposed to public inspection; or by means of public advertisements or circulars, describing modes of practice, or patented or secret processes; or by the publication of his scale of professional charges.

Any registered practitioner not disqualified by any Bye-law who shall be recommended as eligible by any three Members of the Association (the recommendation of one being from personal knowledge), and who has signed the appended form of application for admission and agreement as to terms of Membership, may be elected a Member by the Representative Board or by the Council of a recognized Branch.

The subscription is one guinea per annum, and each member is entitled to a copy of the Journal of the Association monthly, and to attend the Annual Meetings of the Association.

THE MIDLAND BRANCH OF THE BRITISH DENTAL ASSOCIATION.

EXTRACT FROM BYE-LAWS.

1. Composed of Members of the British Dental Association who reside in the Midland and North Western Counties of England, and of Associates who can fulfil the conditions laid down in the Bye-laws. The Annual Meeting takes place in May ;and informal meetings are held in February and October.

2. The Association shall consist of Members and Associates. No one shall be eligible for membership who is not already a member of the British Dental Association. Any registered Practitioner of good character, who does not conduct his practice by means of the exhibition of Dental Specimens, appliances or apparatus in an open shop, or in a window, or in a show case exposed to public inspection; or by means of public advertisements or circulars describing modes of practice; or patented or secret processes; or by the publication of his professional charges, may be admitted as an Associate. Associates shall be entitled to all the privileges of the Branch Association, but shall not be entitled to vote or hold office therein.

3. Any member of the British Dental Association may be elected a Member of the Branch by the Council of the Branch, at any of their ordinary Meetings, on his sending a written application for election to the Secretary of the Branch.

4. Any registered Practitioner who can subscribe to the conditions laid down in Bye-law 2, and who shall be recommended as eligible by any three members or Associates, may be elected an Associate by the Council, on his forwarding the recommendation and his subscription to the Honorary Secretary of the Branch.

5. The Annual Subscription to the Branch is as follows :—Members, Five Shillings ; Associates, Ten Shillings. The subscription to date from the time of election, and from the 1st of January in each subsequent year, and to be paid in advance, but Members or Associates elected in the months of October, November, or December, shall only pay one subscription for the remainder of that year and the following one.

Honorary Secretary, I. RENSHAW, 87, Drake Street, Rochdale.

METROPOLITAN BRANCH OF THE BRITISH DENTAL ASSOCIATION.

Composed principally of members of the British Dental Association practising within the London postal district. The Branch meets three or four times a year, and the Annual Meeting is held in January.

The qualifications of Membership are similar to those in the other Branches.

Honorary Secretary, SIDNEY SPOKES, 59, Queen Anne Street, Cavendish Square, W.

BRITISH DENTAL ASSOCIATION, WESTERN BRANCH.

A person who is registered in the Dentists' Register shall be eligible for election as a Member of the Branch, provided he be of good character ; that he does not conduct his practice by means of the exhibition of Dental specimens, appliances, or apparatus in an open shop, or in a window, or in a show case exposed to public inspection ; or by means of public advertisements ; or circulars describing modes of practice, or patented or secret processes; or by the publication of his scale of professional charges.

Any dental practitioner, being a member of the British Dental Association, who can subscribe to the conditions laid down in Bye-law 4, and has been recommended as eligible by any three members of the Branch may be elected a member of the Branch by the Council.

NOTE.—If the applicant be not previously a member of the British Dental Association, the Council has power to elect to the Association.

Hon. Sec., THOMAS ARTHUR GOARD, 6, West Southenhay, Exeter.

BRITISH DENTAL ASSOCIATION. EASTERN COUNTIES BRANCH.

Districts.

Norfolk, Suffolk, Cambridgeshire, Essex, Lincolnshire, Northamptonshire, Bedfordshire, Hertfordshire, and Bucks.

Bye Law.

Any Registered Dental Practitioner, who shall be recommended as eligible by any three members of the Branch, (one being from personal knowledge,) may be elected a member by the Council. The election to be by ballot ; three black balls to exclude.

Honorary Secretary, W. A. RHODES, 53, Trumpington Street, Cambridge.

BRITISH DENTAL ASSOCIATION.
SOUTHERN COUNTIES BRANCH.

The Branch shall consist of Members, Honorary Members, and Associates. *No one shall be eligible for Membership who is not already a Member of the British Dental Association.* Any registered practitioner of good character, who does not conduct his practice by means of the exhibition of Dental specimens, appliances, or apparatus in an open shop, or in a window; or in a showcase exposed to public inspection; or by means of public advertisements or circulars describing modes of practice, or patented or secret processes; or by the publication of his scale of professional charges; may be admitted as an Associate. Associates shall be entitled to all the privileges of the Branch Association, but shall not be entitled to vote, or hold office therein.

BRITISH DENTAL ASSOCIATION,
SCOTTISH BRANCH.

A person who is registered in the Dentists' Register shall be eligible for election as a Member of this Branch, provided he be of good character; that he does not conduct his practice by means of the exhibition of dental specimens, appliances, or apparatus in an open shop, or in a window, or in a show case exposed to public inspection; or by means of public inspection: or by means of public advertisements; or circulars describing modes of practice, or patented or secret processes; or by the publication of his scale of professional charges.

Any dental practitioner who can subscribe to the conditions laid down in Bye-law 4, who has been recommended as eligible by any of those members of this Branch, may be elected a member by the Council, and shall be admitted a member of the British Dental Association.

Hon. Sec., J. GRAHAM MUNRO, 16, George Square, Edinburgh.

BRITISH DENTAL ASSOCIATION,
WEST OF SCOTLAND BRANCH.

Any person, being a member of the British Dental Association, and whose name is upon the Dentists' Register, shall be eligible for election as a member of this Branch, provided he be of good character; that he does not conduct his practice by means of the exhibition of dental specimens, appliances, or apparatus in an open shop or in a window, or in a show case exposed to public inspection, or by means of public advertisements, or circulars describing modes of practice, or patented, or secret processes; or by the publication of his scale of professional charges.

Hon. Secretary,—WILLIAM WALLACE, 36, Dundas Street, Glasgow.

STUDENTS' SOCIETY OF THE DENTAL HOSPITAL OF LONDON, LEICESTER SQUARE, W.C.

The object of the Society is the consideration of matters specially appertaining to Dentistry. The affairs of the Society are managed by a Council consisting of a President, two Vice-Presidents, Treasurer, two Secretaries, Curator, and nine other members. The President is chosen from the past Students who have obtained their degree of L.D.S.; the Vice-Presidents from past Students with or without qualification.

The entrance fee for ordinary members is half-a-crown, and there is an annual Subscription of the same amount.

Ordinary meetings are held at 8 p.m. on the second Monday in every month, from October to March inclusive during the Sessions. The annual meetings for the election of officers and other business is held on the third Monday of January in each year.

Every member has the power of introducing one visitor, not being a Student of the Hospital or School, to the meetings, with the consent of the President. Visitors are invited to take part in the discussion of the papers and clinical cases.

There is a Library and a Museum in connection with the Society, both being under the superintendence of the Curator.

The Council offer a prize, value £3 3s., at the end of each year, for the best paper read before the Society during that year.

STUDENTS' SOCIETY OF THE NATIONAL DENTAL HOSPITAL AND COLLEGE,

GREAT PORTLAND STREET, W.

This Society, which was established March 16, 1878, was constituted for the encouragement and diffusion of knowledge in Dental Science, and for the promotion of intercourse among its Members: and all Students of Dental Science are eligible for Membership. All candidates for Membership must be approved by the Council before being proposed to the Society for election. The Entrance Fee is 2s. 6d., and the Annual Subscription, 2s. 6d., to be paid in advance. The Ordinary Meetings of the Society are held on the first Friday in each month, from October to June, both inclusive, except October, May, and January, when they are held on the second Friday. The meetings commence at 8 p.m. precisely. Each member may introduce two visitors, not being Students of the Hospital or College, but the same visitors may not be admitted more than three times during one Session.

THE STUDENTS' SOCIETY OF THE VICTORIA DENTAL HOSPITAL OF MANCHESTER.

The object of the Society is the consideration of matters generally and specially appertaining to Dental Science, and for the promotion of intercourse amongst its members.

The affairs of the society are managed by a Council consisting of a President, two Vice-Presidents, Treasurer, two Secretaries, Curator and Librarian, Editor of Transactions, and not more than four Students of the Hospital.

The General Meeting is held on the last Tuesday in every month from October to March inclusive and the Annual Meeting is held in May of each year.

Every member has the power of introducing two Visitors not being Students of the Hospital to a General meeting with the consent of the President.

STUDENTS' SOCIETY OF THE DENTAL HOSPITAL OF LIVERPOOL.

This Society is constituted for the consideration of matters generally and specially appertaining to Dental Surgery.

Candidates for membership must be approved by the Council before being proposed to the Society for election. Such proposals are posted during one meeting of the Society, and remain so posted until the next monthly meeting when the candidate is balloted for. No candidate is elected unless he have the votes of two-thirds of the members present. Eight to form a quorum.

Every member has the power of introducing two visitors, not being Students of the Hospital or School, to the evening meeting, with the consent of the President.

An ordinary meeting is held on the third Friday in every month, from October to March inclusive; the chair is taken at eight o'clock p.m. The annual meeting for the election of officers and other business will be held in October, on the third Friday to receive the Treasurer's andSecretary's next report.

STUDENTS' SOCIETY OF THE DENTAL HOSPITAL OF BIRMINGHAM.

The object of the Society is for the reading and discussion of Papers for the furtherance of Dental Science amongst its Members.

Candidates for Membership must be proposed, seconded, and elected at one of the Monthly Meetings.

Every Member shall with the consent of the President have the power of introducing a visitor to the meeting, who may take part in discussions, but is not entitled to vote on any business.

An ordinary meeting is held on the last Thursday in every month, from October to March inclusive, at the Dental Hospital, Newhall Street, commencing at 6 p.m.

The Annual Meeting for the election of officers and other business, will be on the last Thursday in October next.

The President is W. THOMPSON MADIN, L.D.S. Eng.

All communications for the above Society should be addressed to Mr. F. S. JENKS, Hon. Sec., Dental Hospital, Birmingham.

DENTAL ASSISTANTS' ASSOCIATION OF GREAT BRITAIN.

The above Association has been duly established, having for its objects:

The advancement and protection of Dental Assistants, and the temporary relief of Members when out of employment.

For further particulars apply to the Secretary, 30, Cursitor Street, Chancery Lane, London, W.C.

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GENERAL PATHOLOGY AND SURGERY FOR DENTISTS.

By Edmund W. Roughton, M.D., B.S., (Lond.),
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(*Continued from page* 823.)

SHOCK.

Shock is a condition of depressed vitality due to some profound impression on the nervous system.

The causes of shock are mechanical injuries such as blows upon the abdomen or testicle, extensive burns or scalds, severe and prolonged surgical operations, and powerful mental emotions, such as fright, grief, etc.

In fatal cases of shock the right side of the heart and the large veins, especially those in the abdomen, are found distended with blood, whilst the rest of the body, including the nervous system, is very anæmic. The patient may be said to have bled to death into his own veins. This condition is due partly to vaso-motor dilatation of the abdominal veins, throug the splanchnic nerves, and partly to inhibition of the heart through the pneumogastrics.

The symptoms of shock vary in severity. In the worst cases, the symptoms closely resemble those of severe hæmorrhage. The pulse is rapid and feeble, perhaps imperceptible at the wrist, the respiration feeble, the temperature low, the surface of the body and the extremities cold, the face pale, the lips white, the muscles relaxed, and the skin clammy. The patient may become unconscious and die. When death does not occur, reaction sets in, the temperature rises to normal or a little higher, the surface becomes warm, and the pulse full. If no complications are present the fever of reaction is slight, and soon passes away.

TREATMENT.

In severe cases of shock the patient should be put into a bed warmed with hot water bottles. Small doses of brandy should be frequently given, the effect on the pulse being watched. Opium or morphia may also be given with advantage when there is much pain. In some cases transfusion and artificial respiration may be required.

TRAUMATIC DELIRIUM.

Traumatic delirium is the disturbed mental state that sometimes follows on severe accidents and surgical operations. Three varieties are usually described.

1. *Inflammatory Traumatic Delirium* is only a symptom of septic traumatic fever (which see).

2. *Alcoholic delirium, or delirium tremens* frequently occurs in persons addicted to alcohol when they have sustained an accident, or have been subjected to an operation. Its onset may be apprehended if the patient cannot sleep and refuses his food. The delirium is of the low muttering kind; the patient talks away incessantly to imaginary persons, and fancies he sees loathsome animals on his bed and about his room. Sometimes the delirium is of a more violent nature. The temperature is usually slightly raised, the skin moist, the pulse full and soft, the hand shaky, the tongue furred and tremulous, and the bowels confined. The treatment consists in getting the patient to take fluid nourishment, and in procuring sleep by means of chloral and bromide of potassium.

3. *Nervous Traumatic delirium* occurs in highly nervous over-worked people. It closely resembles the preceding variety, but is not due to alcohol.

HÆMORRHAGE.

Hæmorrhage is the escape of blood from the blood vessels. The hæmorrhage may take place on the surface of the body, (*external hæmorrhage*), or into some cavity (*internal hæmorrhage*), or into the tissues (*ecchymosis,extravasation*). The blood may come from an artery, from a vein, or from capillaries. In arterial hæmorrhage the blood is bright in colour and escapes *per saltum* with each beat of the heart; in venous hæmorrhage the blood is dark in colour and escapes in a continuous stream ; in capillary hæmorrhage the blood oozes out from a raw surface.

The constitutional effects of hæmorrhage vary with the amount of blood lost. When a large quantity of blood is suddenly lost, death from syncope may occur in a few minutes. When the loss is less rapid or smaller in amount, the surface of the body becomes pale and cold, the pulse rapid and feeble, the respiration shallow, and the skin bathed in perspiration, the mind deranged and the sight dim ; syncope supervenes, and sometimes ends in convulsions and death.

THE NATURAL ARREST OF ARTERIAL HÆMORRHAGE.

The means by which Nature arrests hæmorrhage may be divided into general and local.

A. *General means.* The greater the loss of blood, the more feeble is the action of the heart, and therefore the less the force pumping the blood out of the wounded vessel Another result of hæmorrhage is that the blood becomes more coagulable and therefore more apt to occlude the wounded vessel.

B. *Local means.* These are subdivided into temporary and permanent.

(a) The wounded vessel becomes *temporarily* occluded by *contraction* and *retraction* of the cut end, and by the *formation of clot.* The contraction, or narrowing of the cut end is due to the action of the circular muscular fibres in the middle coat of the artery. Retraction takes place because an artery in its normal condition is elastic and slightly on the stretch. When a vessel has been partially divided, retraction and contraction cannot occur, consequently the bleeding may be prolonged until syncope occurs. In a lacerated wound the end of the artery becomes so twisted and curled up that its lumen may be completely occluded. It is not uncommon to see a limb torn off in a machinery accident with practically no loss of blood.

Blood in a healthy vessel does not clot, because the fibrin ferment (which is essential for the process of clotting), is locked up in white corpuscles. When the blood is spilt or comes in contact with the air or any rough surface, the white corpuscles break up and allow the fibrin ferment to mix with the plasma and produce fibrin. When a vessel is wounded, a clot forms inside the cut end, and in the tissues immediately around it, plugging up the opening like a piece of putty used to stop a leak in a damaged box. In the condition known as *hæmophilia* the blood refuses to clot, consequently a very small wound may go on bleeding for an indefinite period, and may cause death. Persons affected in this way are called *bleeders.*

(b) A wounded artery is permanently sealed by adhesive inflammation of the cut end, in precisely the same way as a wound of any other soft tissue. Plastic lymph is poured out by the vasa vasorum of the wounded artery, infiltrates the base of the internal clot, and gradually develops into fibrous tissue. The internal clot is often said to become organised, this is not strictly correct; in reality it becomes infiltrated and destroyed by leucocytes, the original clot, which is only a temporary plug, taking no part in the formation of the fibrous tissue which permanently seals the artery.

Nature's means of arrest of hæmorrhage may be thus summarized:—

Temporary	General	Diminished force of heart beat Increased coagulability of blood
	Local	Contraction Retraction Coagulation

Permanent—Plastic Inflammation and obliteration of wounded vessel by fibrous tissue.

The natural arrest of venous and capillary hæmorrhage differs from arterial only in that contraction and retraction do not take place.

ARTIFICIAL MEANS OF ARRESTING HÆMORRHAGE.

It must be clearly understood that hæmorrhage can be only temporarily arrested by artificial means. A wounded vessel can only be permanently occluded by the process of plastic inflammation as already described. The following are the various means used to arrest hæmorrhage.

1. *Pressure* may be applied by means of the finger, Spencer Wells forceps, the tourniquet, a plug of lint, or graduated compress. The pressure should be applied on the bleeding point; when this is not possible it must be applied between the wound and the heart when the bleeding is arterial, and on the distal side of the wound when it is venous. The object of pressure is to close the wound whilst clotting takes place; it should not be maintained for much longer than twelve hours, lest sloughing result. Pressure is relied upon chiefly when the bleeding vessel can be effectually compressed

against bone, as in cases of bleeding from the socket of a tooth, or from a wounded vessel in the scalp.

2. *Heat* is often used in the form of hot water (a little hotter than the hand can bear). It causes contraction of the muscular fibres of the small arteries.

3. *Cold* also causes contraction, and is often used in hæmorrhage from mucous membranes.

4. *Styptics* are drugs such as perchloride of iron, tannin, matico, etc., which cause coagulation. They should be avoided as much as possible.

5. The *Cautery* acts by contracting the vessels, by causing coagulation, or by charring the tissues. It may be used in the shape of an ordinary red hot iron, the Pacquelin benzoline cautery, or the galvano-cautery.

6. The *Ligature* is the means most frequently used for securing vessels which are too large to be stopped by pressure. The ligature is applied by seizing the bleeding point in a suitable pair of forceps and tying a reef knot round it. The material generally used for ligatures is catgut or silk, which has been rendered aseptic by special means of preparation. When a ligature is firmly applied around a vessel, it divides the internal and middle coats without affecting the outer coat. The divided coats curl up, clot forms on them, and plastic inflammation ensuing, the vessel becomes obliterated. If the ligature is composed of aseptic catgut it soon becomes absorbed ; if of aseptic silk it becomes at first encapsuled in fibrous tissue and then very slowly absorbed.

7. *Torsion* consists in seizing the end of the vessel and twisting it until the coats curl up sufficiently to occlude the orifice.

CONSTITUTIONAL TREATMENT OF HÆMORRHAGE.

In cases of slight hæmorrhage, no constitutional treatment is needed, but when the bleeding is furious and sudden, we must be on the look-out to prevent the occurrence of fatal syncope, by keeping the patient's head low and raising the limbs to ensure a sufficient supply of blood to the brain ; if this is not followed by the desired result alcohol must be administered by the mouth, or rectum, or ether by hypodermic injection. In cases of internal hæmorrhage where no direct means can be used to stop the bleeding, stimulants are inadmissible unless death actually threatens, because the increased action of the heart may displace clots which are occluding the bleeding vessels. The intravenous injection of saline solution (salt ʒi warm water Oi) is sometimes of service by increasing the blood-pressure sufficiently to allow the patient to rally. The remote effects of hæmorrhage must be treated by good nourishment, tonics, especially iron, and sea-air.

Recurrent or Reactionary Hæmorrhage

takes place during the period of reaction and is due to failure of the temporary means (natural or artificial) of arrest. It sometimes happens that during an operation the action of the heart becomes so weak that many of the smaller wounded vessels do not bleed and consequently are not ligatured. When the patient gets warm in bed and begins to rally from the shock of the operation, the heart beats more strongly, the contraction of the muscular coat of the small vessels passes off and recurrent hæmorrhage is the result. This usually occurs within twenty-four hours of the operation.

Secondary Hæmorrhage

may occur at any period until the wound is healed. It is due to failure of the permanent means of arrest of hæmorrhage, or in other words anything preventing the efficient sealing of the vessel by plastic inflammation may cause secondary hæmorrhage. The causes of secondary hæmorrhage may therefore be included under the following heads :—

(1). *Any constitutional condition,* such as Bright's disease, diabetes, septicæmia, etc., which lowers the vitality of the tissues and prevents them from healing properly.

(2). *Suppuration and Sloughing in the Wound.* It is obvious that if these processes involve the wounded artery, healing will not take place, and hæmorrhage will result.

(3). *Disease of the Vessel.* Secondary hæmorrhage is very apt to occur when there is extensive calcareous degeneration of the vessel wall, the latter being very little more than a tube of chalk. Under such conditions plastic inflammation will not take place.

(4). *Defect in the ligature.* The ligature may become absorbed before the artery is permanently sealed, or it may be septic and set up suppuration instead of adhesive inflammation, or it may have caused so much damage to the vessel wall as to lead to its death, or it may be applied so near to a large branch that the wounded vessel is deprived of the rest necessary for its repair

FRACTURES.

A fracture is a sudden solution of continuity of a bone.

The Causes of Fracture are

1. *Predisposing,* such as atrophy, degeneration, syphilitic or tubercular inflammation, new growth, or any other cause rendering the bone more fragile than usual.

2. *Exciting Causes,* which include external violence and muscular action.

(a) External violence may be either direct or indirect, in the former the bone being broken at the place where the violence is applied, and in the latter at some remote spot, *e.g.* the neck of the thigh bone being broken by a twist of the foot.

(b) Muscular action, when sudden and very forcible, may cause fracture. This is most commonly seen in the patella. When a bone is much weakened by disease, an ordinary muscular effort may suffice to break it, such fractures are called *spontaneous.*

VARIETIES OF FRACTURE.

A simple fracture is one in which the soft parts covering the bone are not torn through.

A compound fracture is one in which there is a wound in the soft parts *which permits of air reaching the broken ends.*

A complicated fracture is one which is associated with damage to some adjacent part, such as a joint, or large artery. Fractures are also divided,

1. According to their extent into :—

(a.) Complete,

(b.) Incomplete,

(c.) Comminuted—broken in several small pieces.

(d.) Multiple—two or more fractures in the same bone or in different bones.

2. According to the direction of the line of fracture into,

(a) Transverse,

(b) Oblique,

(c) Longitudinal,

(d) Spiral,

(e) Stellate.

3. According to the condition of the fragments into,

(a) Impacted—one fragment driven into the other,

(b) Fissured—a mere crack without displacement,

(c) Depressed—the broken part depressed below the surrounding bone.

(d) Punctured,—made by pointed weapons,

(e) Splintered—a small piece chipped off.

THE SYMPTOMS OF FRACTURE

1. The patient feels, and sometimes hears, a sudden snap.

2. Pain.

3. Inability to use the injured part.

4. Deformity.—This is due to displacement of the fragments, which may be brought about by (a) the direction of the force producing the fracture, (b) muscular action, and (c) the weight of the part. When the fracture occurs in a limb the displacement of the fragments often produces shortening.

5. Preternatural mobility.

6. Crepitus is a grating sensation detected by the surgeon gently moving the fragments against one another.

DIAGNOSIS OF FRACTURE.

The only sure sign of fracture is preternatural mobility, but it is not always present, *e.g.*, in impacted fracture. Each of the other signs may be at times absent, or when present, may be due to some other cause, thus pain, sensation of snapping and inability to use the injured part, may be due to damage of muscles or ligaments; deformity may be due to dislocation; and crepitus may be detected in joint disease, extravasation of blood or air into the subcutaneous tissues, and in inflammation of the sheaths of tendons.

THE UNION OF FRACTURES.

The union of a simple fracture is essentially the same process as the healing of a wound by first intention. The immediate result of the fracture is extravasation of blood around the broken ends; this gets gradually absorbed, and takes no part in the healing process. Very soon after the injury traumatic inflammation supervenes, and plastic lymph exudes from the inflamed bone, medulla, periosteum and neighbouring tissues. The lymph, becoming vascular, forms a mass of granulation tissue surrounding the broken ends of the bone, and is known as *callus*. That portion of it outside the broken ends is called external or ensheathing callus, that inside the medullary cavity internal callus, and that actually between the broken ends permanent or definitive callus. The internal and external callus is ultimately absorbed, and is therefore often called temporary, (see Fig. 7). The callus becomes converted into fibrous tissue. The outer layer of the ensheathing callus forms the new periosteum, and from its deeper aspect, and from the angle between the separated periosteum and the bone, the process of ossification invades the fibrous callus, converting it into a mass of bone, fixing the broken ends together. In animals, and in some fractures in man, the callus is converted into fibro-cartilage before being ossified.

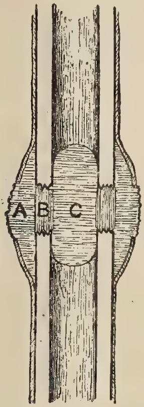

Fig. 7.

Diagrammatic sketch of repair of simple Fracture.
A. External or Ensheathing Callus. B. Permanent or Definite Callus.
C. Internal Callus.

The union of a compound fracture may take place in two ways, (a), the wound over the fracture may heal by first intention, thus converting it into a simple fracture, or (b), suppuration may occur, granulation tissue being formed around the ends of the bone and healing taking place by granulation, or by the second intention. The fibrous tissue thus formed is converted into bone.

NON-UNION.

It sometimes happens that the process of union of a fracture remains incomplete or fails entirely. In certain fractures, chiefly those involving joints (such as fracture of the patella), and those where a bony prominence is knocked off, and dragged by muscular action some distance from its proper place union by fibrous tissue only is the rule, and bony union the exception. When the un-united fragments remain in contact, their ends may become rounded off and enclosed in a sort of fibrous capsule forming the condition known as *false joint*, or *pseudarthrosis*.

The causes of non-union are both constitutional and local.

The constitutional causes are conditions such as scurvy, nephritis, syphilis, gout, old age, which diminish the vitality of the tissues or impede the process of repair.

The local causes are (a) want of rest, (b) want of apposition from muscular contraction, the loss of a large piece of bone in a compound fracture, or from the interposition of a piece of muscle, tendon, or other foreign substance, (c) necrosis of the broken ends, (d) deficient blood supply.

TREATMENT OF FRACTURES.

A. Treatment of simple fractures. The following are the indications:—

1. To place the fragments in accurate apposition so that they may have a fair chance of uniting, and may be, when united, the same shape as the original bone. This is called reducing or setting the fracture.

2. To keep the fragments in accurate apposition by

means of splints or other devices, until firm union has occurred.

3. When union has occurred to restore the functions of the damaged part.

B. Treatment of compound fractures. When the wound is small and aseptic, it should be closed as soon as possible, so as to convert the fracture into a simple one. When the wound is large it must be treated on the general principles already laid down in speaking of the treatment of wounds, and the fracture must be fixed in some form of apparatus which will allow of the necessary dressings being applied to the wound with the least possible disturbance of the fragments. In the case of a severe compound fracture of a limb amputation may be required, when (a) there is great damage to the soft parts, (b) when the bone is extremely comminuted, (c) when the main vessels and nerves are torn, (d) when a large joint is involved, and (e) when the patient is old or broken down in health.

(*To be continued.*)

COPAL.

The value of copal may be estimated by its power to produce, when properly melted and incorporated with linseed oil in true proportions and a workmanlike manner, a varnish possessing in the greatest possible degree the following properties:—Close adherence to the surface of the body varnished with it, hardness, brilliancy, freedom from scaling, absence of colour, greasiness, or dulness, faculty of resistance to sudden changes of temperature, and the power to impart to the varnished object the same shining appearance as if it were covered with glass.

VULCANITE WORK.

By Harry Rose, L.D.S. Eng.,
Lecturer on Dental Mechanics, National Dental College.

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Description of a Case in which the Front Teeth are Fitted on the Natural Gum.

The wax or other plate is first moulded to the model, cutting it away from the part where the artificial teeth have to come into contact with the front gum or the stumps of the natural teeth, if any be present.

In order to make the artificial teeth appear to spring or arise out of the gum in the mouth, like the natural teeth, it is desirable to pare away a slight film of plaster from the model corresponding to the gum under the teeth to be fitted. This allows them to press somewhat on the natural gum, and gives them the appearance of growing from it. Nothing looks worse in the mouth than a space between the neck of an artificial tooth and the natural gum.

This treatment of the model does not apply where there are roots, they of course are ground level with the gum and the teeth must be accurately fitted.

The remaining teeth having been fitted and articulated to the bite, the piece is waxed up neatly, and the polishing plate made and fixed to it, as in the case previously described.

Mode of Inserting a Complete Upper or Lower Set in the Flask, when the Teeth are not fitted to the Natural Gum.

The plaster model is trimmed down so that the alveolar ridge only appears above the edge of the lower part of flask when placed in it. The case having been fastened to the model, some plaster is mixed and a portion poured into the lower part of flask ; the plaster model with case fixed in position is now dipped into water for a moment, and is then sunk into the soft plaster. More plaster is now added to flush from the edge of wax or lower border of case to the edge of flask, and is then smoothed off and allowed to harden (see Fig. 6).

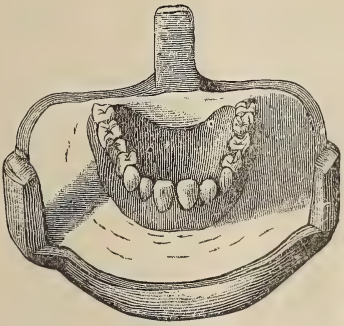

Fig. 6.

When set, the surface of the plaster is covered with a solution of soap, and more plaster mixed, which is worked into the palate and around the teeth. The upper part of flask is then adjusted to the lower; more plaster is added to fill it up, and then the lid of flask put on. The flask should now be placed under pressure in a clamp or vice to force the joints together and keep them so until the plaster hardens. When this has taken place, the flask should be placed on the top of a stove to warm or may be dipped into boiling water for two or three minutes ; this softens the wax and allows of its coming away from the lower part of flask, and also prevents the withdrawal of the teeth from their position in the plaster. After separating the flask the next operation is to pour boiling water into the middle portion to clean away the wax, and leave the teeth embedded in the plaster. When this has been satisfactorily accomplished the case is ready for packing-in the rubber ; this operation is greatly facilitated by the flask being kept warm, for it helps to keep the rubber soft and makes it easier to pack.

METHOD OF INSERTING A CASE IN THE FLASK WHERE SOME OR THE WHOLE OF THE TEETH ARE FITTED ON THE NATURAL GUM.

There are two ways of doing this ; one is to insert the case, on the model, in the upper part of flask, bringing the plaster over the edges of teeth in order to keep them in position. This is not always a reliable way, on account of the plaster covering the points of teeth breaking away with the pressure of the vulcanite. To prevent this occurring pieces of pianoforte wire may be used, bent so that one end comes over the edge of tooth and the other passes under the model. Separate pieces are to be used for each tooth. When the model with these wires in position (see Fig. 7), is inserted in the upper part of flask, and the plaster brought just over the edges of teeth, it forms a support that cannot be broken,

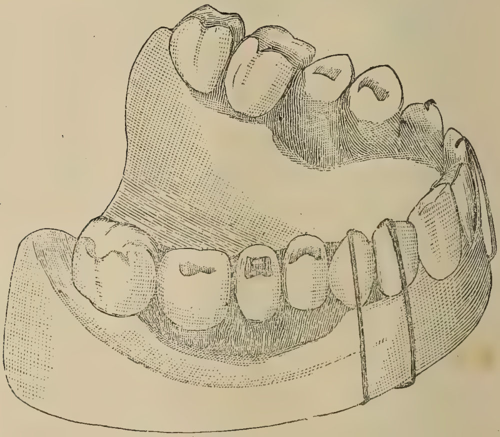

Fig. 7.

and is one of the most reliable ways for keeping teeth from rising, or rubber from getting under them.

The next way is to insert the case on its model under a brass clamp such as is shown in Fig. 8. This is done in the following manner :—

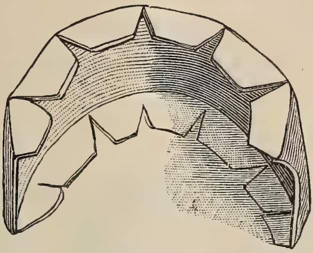

Fig. 8.

Mix up a sufficient quantity of plaster about the consistency of thick batter, and place some in the clamp and the remainder in the bottom part of the flask. The model with the case on is now dipped in cold water, and a little plaster covered over the front part of the model and teeth ; it is now pressed into the clamp, and then both are placed in position in the lower part of the flask. The upper part of the flask should be tried on in order to see that nothing impedes it going home ; if this is done whilst the plaster is still soft it is easy to move the clamp a little one way or the other as may be required. The upper part of flask is then removed, and plaster built up around the clamp so as to convert it and the model into a bevelled surface that is tapering to the top of clamp. It will then present the appearance shewn in Fig. 9.

The plaster surface and clamp are now painted with a solution of soap, and more plaster having been mixed it is placed around the model and clamp, then the upper part of flask is placed in position, filled with plaster, and the lid pressed on.

When the plaster is sufficiently hard the flask may be separated as previously described.

It will now be seen that the case is in the lower part of flask under sufficient pressure to prevent any rising of the teeth, and the case is also presented to us in such a manner that we can see into it and pack the rubber with greater facility, than by having it in the upper part of flask.

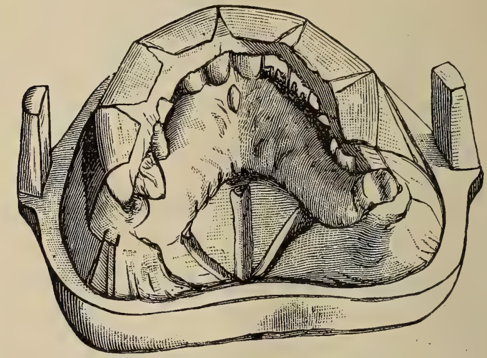

Fig. 9.

By either of the before-mentioned methods reliable results may be obtained.

We will now discuss the subject of packing the rubber.

In packing cases, as mentioned before, it is necessary to have the flask quite warm ; we also want an iron pot or other apparatus containing boiling water, and over this a plate of tin or porcelain on which the rubber can be placed to soften, after having been cut into suitable pieces.

If the case is such as I have represented in Fig. 10, a complete upper, the pieces of red rubber should be cut into sections, say $\frac{1}{4}$ inch by $\frac{3}{4}$ inch, and a larger piece cut from the rubber sheet to represent the palate of case.

The smaller pieces of red rubber should be packed one piece at a time around the backs of teeth coming up to and just covering the pins, or if drilled teeth are used the holes should be filled with the red rubber. On no account should pink rubber be around the pins, as it is not nearly so strong as the red or black rubbers, and they would be likely to draw out.

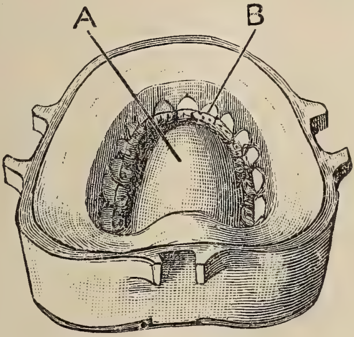

Fig. 10.

Having packed this portion (see Fig. 10.B), the next thing is to place in position the piece that has been cut out to cover the palate A. It will now be seen that all the stronger rubber is in place, and will support and hold the pink rubber which has to form the front gum. Now place small pieces of pink between, and filling up the divisions at necks of teeth, in order to prevent the red showing through. Cover the necks of teeth completely with pink and see that it is properly worked in, after which build up the remainder of gum, also in pink rubber.

In actual work we are guided in our estimate of the amount of rubber required by the amount of wax used in modelling up the case, to which we approximate as near as we can. It is of little moment, however, whether we have a small quantity in excess or a deficiency; the next process will reveal to us either the one or the other.

This operation we will term "boiling out," and it is effected in the following manner :—

When the presumed quantity of rubber has been introduced into the flask to take the place of the wax, a piece of the linen rag that is supplied to keep the sheets of rubber apart in the box, is dipped into hot water and placed over the rubber, thereby interposing between it and the plaster model in lower part of flask when the two halves of flask are put together, which should now be done.

The flask should now be placed in a saucepan or vulcanizer of boiling water for a few minutes, then withdrawn by means of a suitable apparatus, and placed in a clamp or vice and pressed gradually, that is to say, a slight interval should be allowed between the applications of force.

If the flask closes together rather easily, we may find upon separating it and removing the linen rag that we have not quite enough rubber in the case ; this will be apparent by the presence of intervals or spaces between the portions of rubber at one or more places, so we must add more pink or red rubber according to the situations where the want exists. The linen rag is put over it again and the flask is once more placed in the boiling water, again removed and squeezed slowly in vice or clamp. When the rubber presents an unbroken smooth surface, it is an indication that there is sufficient in the flask.

Having again removed the rag, four or five channels or "gateways" are now cut from the posterior border of case to the edge of flask, to allow for the exudation of surplus rubber. Three of these are shown in fig. 9.

The reason that none are cut in the anterior part is that any exudation of rubber in that quarter would perhaps do harm, inasmuch as if the pink rubber is pressed away, red would take its place, and shew in front, which would mar the beauty of the case by giving it a blotchy and mottled appearance.

The gateways having been cut, the two halves of the flask are closed, (omitting of course the rag,) by once more squeezing in the vice. It is now removed and placed in an iron clamp and wedged quite tight with suitable wedges, or if the clamps are fitted with screws, the flask is secured in that way, and it is then ready for the vulcanizer.

The next case to be described is one where the plaster model is dried, and then instead of using a wax or metal plate, the model is painted while hot with a solution of rubber in chloroform, and then after softening a sheet of rubber, cut it into a suitable shape and mould to the model ; we have thus a rubber plate on which to mount the teeth. In arranging the teeth on this plate, we must attach them to it with wax in the ordinary way, taking care, however, to keep the wax away from the front gum.

When they are fixed and built up at the back, the palate should be coated with a solution of soap, and plaster cast into it, so that it covers the palate and just covers the crowns of molars and points of front teeth ; this is to keep the teeth in position while the pink gum is being moulded on. This is the next operation, and should be done neatly, using suitable tools and shaped pieces of pink rubber, and coating with the rubber solution any part that may require it, to make the pieces of rubber adhere firmly to each other.

After moulding up the front gum with rubber, the plaster plug may now be removed from the palate, and we may finish the remainder of work by one or other of the following methods.

The first consists in roughing or grooving the front part of plaster model, damping it and then mixing some plaster and covering with it the front part of model and also the crowns and points of teeth.

When this is hard rubber can be packed round the palatal or inner side of alveolar ridge, when the wax has been removed. The case can now be placed in the flask direct and covered in with plaster.

A second method consists, after the plaster plug has been removed from palate of case, in placing the case under a clamp (see Fig. 8), and inserting in the lower part of flask and building up the plaster around it as previously described.

It is now painted with a solution of soap, and the upper part of flask placed in position and filled in with plaster.

When hard and the flask is warmed, it may be separated and the wax removed from the backs of teeth with boiling water, and replaced by more red rubber. It will thus be perceived that the only packing required while the case is in the flask is at the backs of teeth the palate and front gum having been already finished.

Of course the flask has to be heated up or placed in boiling water with a piece of linen interposed between the two halves as previously mentioned, to allow of a parting between them and to ascertain if there is enough material. After this the flask is closed and fastened in a clamp and is ready for the vulcanizer.

The usual time for vulcanizing dental rubbers is about an hour and a quarter at a temperature of 315 deg. Fahr., represented on the pressure guage by 100 lbs. A slightly lower temperature and the vulcanizing prolonged to one hour and a half is, I think, preferable ; it makes a stronger and more elastic piece, not so brittle. About half a pint of water should be put into the Vulcanizer when placing the flask in. The lid should then be screwed down and the gas turned on to heat it up. When the time mentioned for cooking has expired and the gas is turned off the heat should be allowed to go down gradually until no pressure or degree of heat is indicated by either guage or thermometer. The lowering of the temperature may be accelerated by allowing cold water to trickle over the boiler, which if of copper or gun metal will not be harmed, but on no account should a cast iron boiler be treated in the same way, as it would in all probability crack it.

The boiler lid is now unscrewed, the flask taken out and placed in cold water.

STRENGTHENERS—METAL.

The insertion of these in rubber plates is a matter that requires some amount of care and consideration in order that the strengthener itself may not prove a source of weakness to the case.

For an upper piece of work the strengthener should be on one side of the vulcanite, preferably on the inferior palatal surface. The rubber therefore would be between the strengthener and the surface of model, and thus any pressure in the molar region would have to overcome the resistance of the strengthener before acting on the rubber plate, whereas if the strengthener was next the model on the superior palatal aspect, the strains of mastication would be upon the vulcanite first, which would yield and be liable to break.

Neither should it be placed (I am speaking of upper cases) in the centre or substance of the rubber palate for such only weakens the case. Exception to this rule must, however, be made in the case of perforated strengtheners which must have rubber on either side of them.

An upper strengthener ought to conform somewhat to the shape of the palate, and should be swaged or struck up on a zinc or type-metal cast representing the palate of the case when properly waxed up. No. 7 plate is strong enough when it is made tolerably broad as the majority of upper strengtheners should be, but if a narrow one is used, then it should be stronger, that is, thicker in proportion, say No. 8 or 9, plate guage.

Strengtheners should be stronger in the centre than at the extremities, and have loops or pieces of wire soldered on to retain them firmly in the vulcanite.

The edges should also be bevelled with a file that the rubber may overlap, so that when the case is finished up the vulcanite will come flush with the surface of strengthener.

When the case is in the flask and ready for packing-in the rubber the strengthener should be placed in position in the upper part of flask, or in other words, on the inferior palatal aspect of case, and then the rubber packed over it, the case being then further packed in the usual way.

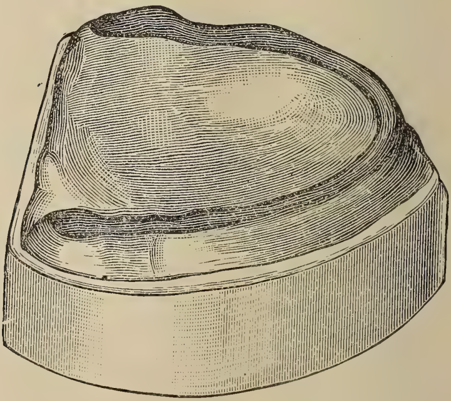

Fig. 11.

In some cases of prominent bite, or where the pressure of mastication comes forcibly on the rubber at the back of front teeth, with a tendency to force those teeth out, the strengthener may be swaged up so as to form a biting surface by stamping it up to a die representing the points of the opposing lower teeth.

This is trimmed up and loops soldered to it. In this instance the strengthener should be sunk, by being made warm, into the wax palate of case and fitted to the bite before the piece is put into the flask.

Another form of strengthener, and one peculiarly adapted for a case with a very thin palate is made in the following manner. (Figs. 11, 12 and 13.)

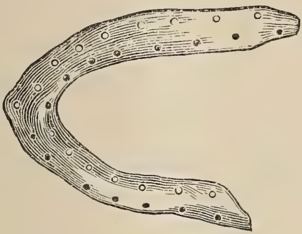

Fig. 12.

The first shows model to which a thin matrix plate has been adapted, and along the alveolar ridge wax has been moulded.

A zinc die and lead counter having been obtained, a piece of No. 7 plate, either dental alloy or gold is struck up as in Fig. 12, and holes drilled in it. This strengthener is now placed on the model as in Fig. 13, and the plate is ready to mount the teeth upon.

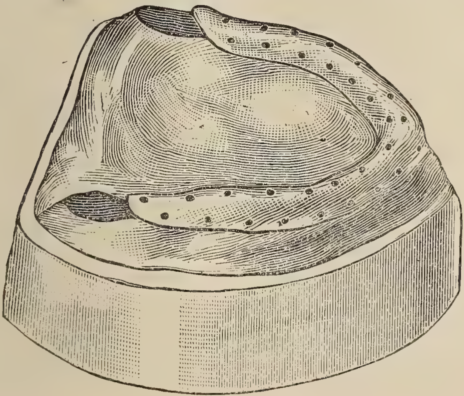

Fig. 13.

This style of strengthener makes a very strong case, and at the same time does not interfere with the thinness of the palate.

For a lower case a bar may be made of pretty thick wire, about number 4 or 5 guage, placed along the necks of teeth in the substance of the rubber plate. This will be found sufficiently strong for the majority of lower cases; or a piece of plate can be swaged and perforated and sunk into the substance of the rubber when the case is being packed.

To illustrate the use of a strengthener, I may mention the case of Mr. R.:—

In this case was presented an upper model with a space for four teeth on the right side and on the left side only space for one.

As this patient had been wearing a vulcanite piece rather large and clumsy, it was determined to make him a case of the same material, only very narrow; to do this it was necessary to swage up a thick narrow plate which extended round to the single tooth, and formed a tongue to which it was soldered, holes were then drilled into at the extremities, and along the centre of plate.

The model having been dried and made warm, it was painted with chloro-rubber. A slip of rubber, having been reduced, by stretching, to one half its original thickness, was cemented to the model by means of the rubber coating its surface. The model was then warmed again, thus softening the rubber; the strengthener also having been made hot, was pressed into the rubber, a few more pieces were added to extend to the backs of natural teeth, and then the artificial teeth on the right side were mounted and held in their places by means of wax.

The only part necessary to pack when the case was inserted in the flask and made ready for the vulcanizer was that from which the added wax had been removed.

In this case the strengthener could not be inserted in the ordinary way, because a portion of it had to form a tongue to carry the single tooth and strengthen it.

This case when finished presented a very neat appearance, having the beauty of fit of a vulcanite case with the strength of a plate. It fitted the mouth perfectly, not requiring any clasps to retain it in position.

This method of packing rubber is particularly useful when one has a case that presents a difficulty in packing in the ordinary way in the flask.

Cautions to be observed in Vulcanite Work :—

1st. To remove all traces of wax, grease, or dirt from the flask.

2nd. To cut away all overhanging or thin edges of plaster, in case they break away and get into the rubber.

3rd. To avoid packing-in too much rubber in the flask. It is preferable to have too little than too much ; in the first case one can easily add more, but in the latter, although one can remove the surplus by heating the flask, by placing it in boiling water and then pressing in a clamp or vice, yet one risks forcing the red rubber into the pink, thus producing a mottled and unsightly gum. Care must likewise be observed in squeezing the two halves of a flask together after packing; the pressure should be applied gradually, giving the rubber time to spread, and on no account must the piece of linen rag be omitted between the two halves of the flask. It should be dipped in hot water before placing in position, and should it not part readily from the rubber after pressure, a little boiling water poured on it will enable that to be accomplished.

4th. Just before the flask is closed for the last time, gateways should be cut in the plaster from the posterior part of case to the edges of flask ; this allows of oozing to take place only in the red rubber and thus counteracts any tendency for the red to run into the pink gum.

And 5th. The two halves of flask should fit perfectly close together or else we shall have the case thickened and the bite raised by the width of the interval represented by the imperfect closure of the flask.

(*To be continued*).

PLATINUM.

Platinum occurs in the Ural Government of Perm, in Russia, where it is found on various private properties and State lands. The metal is found in the form of alluvial deposits or platinum-bearing sands, which frequently also contain gold. These deposits vary in thickness; they are rarely less than three, and often reach seven feet; the grains are usually small in size, but occasionally small nuggets are found weighing one or more kilogrammes. The platinum is frequently accompanied by other rare metals, such as iridium and osmium. At present all the platinum extracted in the Urals is forwarded in the crude state to St. Petersburg, whence it is sent abroad. Although there are two laboratories in the Russian capital for refining platinum ore, the greater quantity is sent abroad in the crude state. When the price of the metal is high it becomes profitable to work the poorer deposits, while it is only possible to work the very richest when the price is low. Although the first platinum deposits in Russia were discovered so far back as 1819, the actual exploitation of this metal began only in 1824, when rich veins were discovered in the Nizhni-Tagilsk district. The value of the yearly export of platinum, which goes chiefly to England, is about 1,560,000 roubles. The largest quantity of platinum is now extracted at the deposits of Nizhni-Tagilsk, belonging to Prince Demidoff San Donato, and at the Krestovosdvigensk deposits of Count Schouvaloff. In 1890 there were 6,000 workmen employed in the exploitation of platinum.

British Journal of Dental Science.

LONDON, OCTOBER 1st, 1894.

PATHOLOGY.

Those who regard Dentistry as something more than the extraction of natural teeth and the substitution of artificial ones, find it a matter of duty to note the advances made in medical knowledge. Our students are expected to know some Pathology, and the articles by Mr. Roughton now appearing in the Journal provide the conscientious practitioner with an opportunity of keeping pace with the more youthful diplomate. There can be little doubt but that improved methods of treatment of disease mark the highest tide to which the latest discoveries in Pathology have risen; and when it becomes known what the departure from a normal function of a tissue or organ really means, the interpretation demands that the old treatment should undergo modification or even become extinct. The new treatment may be so far-reaching as to require preventive measures, and may extend in unexpected directions. For instance, (to take a case recently prominently presented) the treatment of dental caries may shut one possible entrance to the bacillus which is now known to be associated with tuberculosis.

Medicine is necessarily progressive, and judging from the past, one ought not to expect that the results obtained to-day may not have to give place to new demands in the future. And yet when one regards the value (apparently immense) of the most recent advances, it is scarcely possible to avoid wondering whether such results are at some future period to be regarded in somewhat the same light as we now look back upon the "humors" and routine blood-letting of former times. Whether or not we imagine that each added fact in the mysteries of Physiology and Pathology is another stepping stone towards some distant optimistic condition when human flesh will no longer have a heritage of ills, we may in the meantime take advantage of every little gain for the amelioration of present suffering.

Most of us think we know something now-a-days as to the battle between the microbes and the leucocytes, and, perhaps overlooking the useful functions of the former, find our sympathies with the latter. Dr. SIMS WOODHEAD, in an address at Bristol the other day, called attention to the fact that other, so-called fixed, cells must not be overlooked, and that in inflammation for instance, the cells of the vessel wall are gradually assuming a greater importance, and the leucocyte is becoming recognised more as a coadjutor or an assistant in the process. There seems reason to believe that these cells of the vessel wall have a function with regard to the transudation of lymph from the capillaries. In the liver, especially, whether as true secreting organs, or in some other way, the endothelial cells appear to have much to do with the removal of peptones or bacteria from the blood-stream. There is an accumulation of leucocytes and marked changes in the endothelial cells, the result of stimulation. Endeavouring to apply these facts practically, Dr. WOODHEAD considered some conditions due to organic poisoning. The products of certain bacteria affect the endothelial walls of capillary blood vessels, and as a result we may get the swelling in a case of malignant œdema, or perhaps a pneumonia may be set up by obstruction of the capillaries in the lung.

By studying the broad generalisations of Pathology, dentists may apply the lessons to their own immediate field of work. The bacteriology of the tooth-pulp, for instance, should well repay observation, and the results should have a bearing upon such practical questions as "capping" or "devitalisation." Professor MILLER, of Berlin, is doing good work in this direction, and Mr. G. G. CAMPION, of Manchester, has made a preliminary communication which is well worth reading.

DIPHTHERIA.—At the International Congress of Hygiene at Budapest, the greatest interest attached to the treatment of Diphtheria by the injecting of serum from immunised animals. Professor Roux presented statistics from the Hospital for Sick Children. During four previous years the mortality from diphtheria was 57·71 per cent. Between February and August of this year all the cases of diphtheria, 448 in number, were treated with serum; the mortality was 24·5 per cent. Another Children's Hospital in Paris in which 520 patients were treated without serum during the same months, had a mortality of 60 per cent. It is found that the horse is the most convenient animal from which to obtain the necessary serum. Cultivations are first made of the bacillus, and the toxin obtained by filtration is injected into the horse in sufficiently small doses to gradually render it immune to an otherwise poisonous quantity. The blood then drawn, as required, from the jugular vein provides the serum for the Children.

A FATAL CASE OF ALVEOLAR ABSCESS.—An inquest has been held at the London Hospital as to the cause of death of a man aged forty-four years. He had been suffering from toothache and after the extraction of the tooth he seems to have been taken into the hospital where he remained until his death. The house surgeon, basing his evidence upon a post-mortem examination, said there was gangrene of the lungs caused by the pus from an abscess on the right side of the neck. Death was due to exhaustion following the abscess. It had been suggested that an injury to the neck, by a blow some seven or eight months previously, might have had something to do with the condition, but the medical witness did not agree with this view; he considered it arose from a bad tooth. Apparently this was one of the cases sometimes described as "extending alveolar abscess," followed by pyæmia of which instances, with a fatal result, are from time to time recorded.

WHERE WERE THE RETAINING POINTS? There is some difference of opinion in regard to the way a cavity should be prepared for the reception ot gold, and many make use of a "retaining point" merely to start the filling. *The British Medical Journal* refers to a dento-legal case in which the fate of a gold filling raises some interesting points. A New Jersey young lady was kissed with such fervour by her lover that a stopping came out of one of her teeth. The gentleman repudiated his liability to pay for repairs, and the engagement was broken off as well as the filling. In the action pending we imagine the dentist should be called as a principal witness to testify as to the stability of his work to stand reasonable wear and tear. In that case the jury may possibly get a lecture on the respective merits of "retaining points" and "grooves." As, however, the stopping does not appear to have been a British product, we forbear further criticism, especially as no reliable details are to hand.

A CHILD'S BLESSING.—This enticing description is said to have appeared on the label of a powder supplied by the wife of a herbalist. According to a report, in the *Chemist and Druggist*, of an inquest on a little girl aged one year and eight months, the instructions on the packet directed that only half the powder should be given to a child under three years of age. The whole was administered to the baby which was seized with convulsions two hours afterwards and died the next morning. According to the report the medical evidence showed that death was due to convulsions produced by calomel contained in the powder. It is customary to believe that the continued administration of mercury in teething powders injuriously affects the proper, development of enamel, which is scarcely a condition to be described as a "blessing." Whether the action of this drug in sufficiently large doses as above, may be so euphemistically described is scarcely a matter we can enter into, but a blessing is frequently associated chronologically with a departure.

Abstracts of British & Foreign Journals.

THE ART OF THE SURGEON.

By J. Greig Smith, M.B., M.C.

The art of the surgeon may, for purposes of comparison, be viewed from two aspects. One is allied to the art of workers in wood and iron, and may be called mechanical. The other aspect has little of the mechanical about it, and is closely allied to a fine art. The mechanical side, the art of the application of tools, is an important but comparatively simple one, and need not detain us. Easily learnt as it is, it is still worthy of being taught. It is not, perhaps, a good thing that a surgeon should handle a saw, or chisel, or a drill, or a trephine for the first time on a living human bone; and it would be well if we, who have much to do with apparatus, knew the qualities of the metals and other materials we employ, and the ways of jointing and welding and moulding them to meet the ends we desire. It would, in fact, be good for most surgeons to spend a month or two in a mechanic's shop under the severe discipline of a skilled British workman. With most of us it would certainly not be labour wasted; but I would not make tuition in the joiner's art compulsory because we use joiner's tools. In respect of technical skill in their handling, I would place the surgeon's tools on the level of the sculptor's spatula or chisel, or only a little higher. The chisel of the sculptor and the knife of the surgeon are mere incidents or accessories in the work to be compassed by the brain-compelled hands. Still, as accessories they have their importance; we ought to be familiar with our tools. But the surgeon, I repeat, is more than a mechanic; he has work to do which brings him to the level of the true artist. The other side of our craft I would venture to compare with that which produces what are known as works of art; and this side is by far the more important. Here the work of the fingers is of small moment as compared with the work of the brain. The brain is supreme, and yet, in delicacy, deftness, and general preciseness of obedience to the brain's behests, the fingers and hands have great calls made on them. In painting, sculpture, or music mere manual dexterity is rarely deficient to him who has the artistic soul; or, if there is deficiency, practice and education will do much to remove it. So in surgery the hands rarely fail to rise to the demand the brain makes upon them if they are trained. Let us look a little more closely into the surgical fine art, for it is nothing less than a fine art. The highest part of the surgical art is more than handicraft—it is braincraft uttered through the fingers. It is not mere manual dexterity or cunning. In fact, mere manual cunning, being a result of routine practice which begets reflex movements, is detrimental to surgical art, which demands the widest scope and variety of action. I should not quote the marvellous manual dexterity of the button-maker as the highest education of the hand, any more than I should quote the clever work of the oak-grainer as the highest art in painting. The surgeon's art demands breadth and variety in manual training: the hands must have all-round capacity. The finger surgeon begins at the wrong end; he ought to have been a button-maker. No training, however, comes amiss to the surgeon's fingers. By many devices and practisings he may and ought to improve their capacity; but their final and most perfect training is in the actual work.

The skill of the hand depends greatly on the sense of touch and on what has been called the muscular sense. We are endowed with a sense of touch more delicate, perhaps, than is found in any other animal—the only sense in which we excel. The highest cultivation of the sense is essential to the surgeon.

The Lancet.

Buccal Antisepsis.—The most efficacious procedure of buccal disinfection consists, according to Dr. P. Unna, in cleaning the teeth with a brush abundantly charged with finely pulverized potassium-chlorate, after which, of course, the mouth should be carefully rinsed with water. Potassium chlorate thus applied exercises, he says, a powerful antiseptic action, by virtue of its microbicidal properties, and by provoking hypersecretion of the salivary and mucous glands, which contributes very efficiently to the expulsion of alimentary *debris* and epithelial and mucous concretions.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

(The following is the Discussion upon Mr. Edmund Owen's Paper on The Treatment of Carious Milk Teeth, which we published on September 1st.)

Mr. F. J. Bennett said he wished to thank Mr. Owen for the valuable hints he had given. One could not be too often reminded of other people's points of view. They were often apt to be too one-sided, but at the same time he ventured to think that their position as dentists had not been materially assailed by the paper. He would first point out that the conclusions to which they would most of them come was that undoubtedly the permanent teeth were materially injured as regards crowding by the premature extraction of temporary teeth, whether carious or not. That was a position which over and over again had been fought out by means of measurements of all descriptions of models by Mr. Tomes, and by others whose names carried great weight. There were also specimens in the Museum which would he thought convince even Mr. Owen that the permanent teeth were actually held back by the crowding of the temporary teeth which remained. If one temporary tooth was taken out say in the bicuspid region, the first molar and the first bicuspid might so come together as to quite prevent the second bicuspid erupting at all. He did not think that any member of that Society, or, indeed any good dentist would be inclined to retain a temporary tooth when the lymphatic glands beneath the jaw had enlarged ; therefore that was out of the question. He had brought down a specimen, thinking Mr. Owen might touch upon that subject, which gave an argument both ways. Mr. Owen did not allude to the evil effects of carious temporary teeth when they advanced so far as to produce alveolar abscess and to destroy the developing permanent teeth. The model produced played into his hands, so to speak, at the same time had that tooth been stopped at an early age they need not have had that result. With regard to exposed and inflamed pulps of children's teeth, the acute pain spoken of in adult teeth was not quite so bad in children; it rapidly ran its course, it was not complicated with pulp stones or calcified masses in the pulp, and therefore the application, either of a minute quantity of arsenical fibre, or even of strong carbolic acid would often stop severe pain without doing very much damage.

Mr. CHARTERS WHITE said one could only speak from one's own experience, but no doubt it was very desirable on the whole that teeth should be retained. One point for which they ought to thank Mr. Owen, was his remark as to the difficulty of getting constant supervision of the teeth of children from the ages of 5 to 8. Parents very seldom brought them until they suffered pain, and then it was too late to do very much. The plan he adopted in practice was to put some strong carbolic acid into the cavity, and then run some very thin oxy-phosphate stopping into it, letting it set, and in that way the tooth was kept for a very long time. He did not believe in putting arsenical paste into the temporary molars of a child, for as they knew the pulp of a temporary tooth was very large, and sometimes a good deal of ulceration was produced. With regard to putting a Donaldson bristle into a child's temporary molar, he did not think it would be at all advisable and would not be practised by any one who had much to do with the temporary teeth of children.

Mr. GEORGE CUNNINGHAM said an earnest consideration of the paper would prove that it was not only of great value to dentists, but was also of great value to medical men. The point as to the advisability of the Medical Council making it compulsory that every medical man should know something about the anatomy, physiology, and pathology of the teeth was of the greatest importance. Mr. Owen had suggested that it would be well for somebody to go "missioning," as he had himself done that evening, and to read a paper before some of the Medical Societies. One Medical Society had approached a member of the Odontological Society, with a view of his addressing them on "How best to preserve Teeth." The gentleman so approached suggested that the lecture should be on the "Preservation of the Function of Mastication," something more than the mere preservation of teeth. The Medical Committee found it unprecedented that a gentleman not a member of their Society should address them, and after considerable expense had been incurred the paper was withdrawn at the urgent request of the Medical Society. However, it was perfectly evident so far as the Dental profession was concerned that if rightly approached they were ready to undertake such work when they were sure of getting a reception. With regard to the cases brought before them by Mr. Owen he did not think that any one would go in for an elaborate dental treatment of the carious milk molar where it was complicated with swelling of the cervical glands. Mr. Owen had suggested that the dentist's idea in the preservation of the milk teeth was to prevent crowding. No doubt that was a very serious factor, and he did not underrate it for a single moment; but the most important factor of all was this, that the child had got molars; and the molars were intended to be used, and if those carious molars were not treated the child went without performing tho natural function of mastication. That was the principal factor. Mr. Owen had told them there ought to be periodical inspection. The trouble was not that the dentists saved too many teeth; in many cases they erred by extracting too many milk teeth, and the common practice of dentists was rather extraction than careful filling. The great point was to encourage the bringing of children earlier to the dentist, and thus avoiding the horrors of the dentist's chair. He appealed to any one present if it was not possible to treat children in such a way as to preserve the functions of the jaws, and at the same time altogether obviate the horror of a dentist's chair. He thought that this could be ensured if the children were brought early when the cavities were in the first state of decay, and did not necessitate a clearance of the pulp cavity or root treatment. With regard to rhizodontropy he thought the sooner that operation was wiped out of dental practice the better. They owed the essayist a debt of gratitude for pointing out the subject of testing the aseptic condition of the root canal, for to test it with the olfactory sense was certainly a very unscientific method. With regard to the final conclusion of the essayist, that children would be happier if there were more extractions, he thought it was bad enough in the case of an adult, but it was far worse for a child when its teeth had to be taken out prematurely. With the divergent roots the strain and struggle for the child were often great. That must be avoided as far as possible; at the same time in serious cases with complications of a secondary nature he did not think anyone would hesitate to assume the function even of an executioner. There was one point in the treatment of temporary teeth in the early stage of decay which he thought had not been sufficiently practised. They knew perfectly well that the reason why teeth decayed so much was because of congenital defects in the fissures of the molars. He had found it good practice to fill such teeth even before there was such a cavity as to make it desirable to use the dental engine. When they found deep crevices in the molars wherein food would lodge and decay follow, it was well to fill them as a preventive. Amalgam by itself was not adhesive, but it could be made adhesive by putting a layer of phosphate cement as a lining. It was not antiseptic in its character, but it could be given an antiseptic character by mixing with it a little sulphate of copper. By this means a great number of teeth might be saved, without the child ever knowing anything of the pangs of the drill. They must get rid of the adult's notion of the horror of the dental chair. For the child the dentist's chair should be attractive, but in order to secure this the children should be brought from the first, even from the age of two or three years. He had known cases where children came to look upon a visit to the dentist with pleasure, but that was where it was not necessary to use a Donaldson's bristle or any such complicated arrangement as the dental engine, the use of which was owing in great measure to the neglect of the parents and the apathy of medical men with regard to early treatment. He urged that the dental surgeon should do his best in order to modify his operations to suit the child, thereby keeping the child from any dread of the dentist.

Mr. Sidney Spokes said he had thought that Mr. Owen in alluding to swollen cervical glands, would have referred to that which was even more serious than the ordinary septic infection, viz., the entry of the bacillus of tubercle into the organism of the child, which might have been adduced as an additional reason why carious molars should not be neglected. He did not suppose that dental practitioners were really open to the charge of neglecting carious molars. The charge brought against them was as to the treatment they should adopt with regard to them. With reference to the premature extraction of temporary milk molars, and to rhizodontrophy he stated that he had records of over a thousand children', mouths, many of which he had seen twice during the years in most of which he had filled permanent teeth, and in some few temporary teeth. The whole question with regard to the extraction of the temporary molar, and its influence upon the permanent molar, was the period at which the extraction took place. He believed that the subsequent development of the jaw would not be influenced by the extraction of the temporary milk molar. He would be inclined to go further back, and to say that the child inherited a certain development of jaw, and so long as a certain amount of nutrition was kept up in the child it would maintain the development of jaw handed down to it by its ancestors. Whilst he was inclined to go in for symmetrical extraction of permanent teeth he thought the symmetrical extraction of temporary molars should be avoided as far as possible. Supposing in the upper jaw the second temporary molar was perfectly sound, and the lower second temporary molar was bad and unhealthy, and it was a question whether they would resort to rhizodontrophy or a Donaldson bristle, he did not think they were doing very much harm in extracting that lower second molar, because he did not believe the first permanent molar would be able to travel forward. He had distinct notes of such cases in which the upper temporary molar was perfectly sound and strong, in which the lower temporary molar had been extracted and the first permanent molar had been unable to come forward. It had been a case of interlocking in the articulation. He was not in favour of the use of the word "rhizodontrophy," but preferred to use "rhizodontropy" as a more correct term.

Mr. J. F. Colyer wished to thank Mr. Owen very much for his paper which opened up many points of interest. He was particularly interested in the treatment of children's teeth, but certainly thought that Mr. Owen looked at that question from a rather pessimistic point of view. He thought that in cases where they met with children with tuberculous glands, or where the surgeon met with them, it would be much better if the surgeon and the dentist held a consultation upon the point. In many cases where these tuberculous glands were ascribed to certain temporary teeth, when carefully examined to see whether the lymphatics actually drained into the gland, they often found that another source must be sought, and in many cases swollen glands about the neck might very often be attributed to other lesions about the patient. Twice within the last year he had had patients with enlarged lymphatic glands in the cervical region, and had been asked to extract some carious temporary molars; on both occasions he discovered that the trouble was due to other causes. When he met with a case of swollen tuberculous gland in the region of the jaw, and really thought it was due to the carious tooth, he did not hesitate to extract, but because a patient came to him with a dead carious molar he was not necessarily going to extract it; on the other hand if there was any tendency to glandular enlargement about the neck he should extract it. If he had a child come to him perfectly healthy, with a dead carious molar, he should certainly endeavour to save it. Then as to the manner of saving these temporary teeth. Mr. Owen referred to a case of temporary molar with an exposed nerve and a tender gland under the jaw. He (Mr. Colyer) had always understood that there were no lymphatics in the pulp; how, then, was this exposed pulp causing a diseased gland under the jaw? In the case quoted by Mr. Owen, in which he considered it would be much better to extract the tooth, he (Mr. Colyer) would undoubtedly say that the child should have had the pulp of that tooth killed and treated in the proper way. He wished to defend the use of arsenical paste in temporary teeth. Practitioners constantly said they had never used it, but he failed to see any reason why arsenic should not be put in a temporary tooth. The only thing was not to leave it in too long, but he was quite sure that in the majority of cases arsenic might be put in with safety. Then as to the treatment of a tooth perfectly dead; they were asked how they were going to treat a carious dead temporary molar? He was rather inclined to clear out the pulp canal as thoroughly as possible, using antiseptics, getting it as clean as possible. He should certainly use cotton wool, and if on passing cotton wool down the root canal it was found perfectly free from odour, that was a fair test that the canals were free from septic matter He would ask what scientific method Mr. Cunningham would use in order to determine whether the root canal was perfectly aseptic? He (Mr. Colyer) knew of none, except the test with cotton wool. There were cases in which they could not get the canal clear, in which rhizodontrophy was perfectly justifiable, and he did not at all mind owning that under such conditions he did perform it. What other treatment he could adopt he did not know, There were cases where they could not fill the pulp chamber, but where, by performing rhizodontrophy, they were enabled to save the temporary molar for two or three years. If the canal was filled with some antiseptic and rhizodontrophy was performed, the child being perfectly strong, there would be no septic infection of the glands. Mr. Cunningham had referred to the early treatment of temporary teeth. Dr. Kirk had recently written in the *Cosmos* that in the case of six-year-old molars; where he had thought the fissures might increase, he had put in a patch of oxyphosphate. That seemed a very reasonable treatment and one that might certainly be adopted. When a patient came with a lymphatic gland enlarged and a carious temporary molar, it was well to be quite certain that there was not some other cause for the enlarged gland. There was one point which had not been referred to, but which he considered the principal cause of swollen glands: it was not so much the carious temporary molar, but the six-year-old permanent molar. Summing up their experience with children, he thought they should adopt every available means to save the teeth. If the work were done thoroughly, if the nerve were killed and the pulp canal were in an aseptic condition, they would save the teeth of the children without incurring any further trouble.

Mr. Storer Bennett said they would all agree that Mr. Owen's paper had been at any rate amusing. Mr. Owen came there as a visitor to give his opinions on these matters, but he was quite confident that were Mr. Owen to present himself at any of the examining boards and there produce the opinions he had now given on the physiology, pathology, and surgery of the teeth, he would not find those opinions accepted. There was hardly a statement made by Mr. Owen that evening which was not capable of being challenged, and it would be exceedingly unfortunate to allow such a paper as they had listened to, to pass without challenge. Mr. Owen had stated that one reason why it was objected to take out temporary molars was that it was thought that the jaw would not afterwards develop. That was an opinion long since abandoned by everybody. He stated, secondly, that they were afraid of clearing out the temporary molars because crowding and jamming together of the teeth would subsequently take place. Mr. Owen, of course, had not had the same opportunities of seeing and treating irregularities of permanent teeth as many of them had, but he was quite sure that if he had had such opportunities he would have spoken in a different manner as to the result of clearing out the temporary teeth. He was perfectly certain that Mr. Owen did not appreciate in any degree whatever the risks he was running of materially damaging the whole development of the arch by the ruthless extraction he advised. As an instance of somewhat curious pathology, Mr. Owen had spoken of the extraction of a tooth with swelling at the roots and tenderness about the gum. The patients he described were certainly not suffering from caries of the molars only, but the chief symptoms were those of periostitis. He spoke as though caries of teeth was the only thing the patient suffered from, which seemed to be perfectly outside the mark. Mr. Owen had thrown an aspersion on the care of the average dentist in saying that swellings took place under the jaw and the dentist did not notice them. The general matter of routine was to put the hand under the jaw to see if there was any tenderness. He was perfectly confident that the average dentist was a far more careful man, and far more experienced in his special work, than Mr. Owen appeared to imagine. With regard to treating the pulp in temporary teeth and the ruthless use of the Donaldson bristle, he could only say if that was the kind of treatment that Mr. Owen had seen, his experience had been somewhat peculiar. It was only just to members of their profession, who were apt to be very unfairly treated by surgeons, to say that he was certain that there was no one dental surgeon who would treat such a case in the manner described. No doubt Mr. Owen, wishing to emphasize the importance of not allowing any source of infection to the cervical glands to exist, appeared to think that as carious molars were capable of being a source of infection they were always the source. He wished fully to agree with what had been pointed out by other speakers as to the importance to young children of a continued inspection of their teeth extending over several years. He thought it was not fair to pass over the paper and the praise that had been given to it without offering these criticisms, although no doubt they were greatly indebted to Mr. Owen for bringing forward the very interesting subject.

Mr. W. B. Paterson said he thought they were getting rather too serious. It appeared to him that Mr. Owen, from what he gathered from the paper generally, advised the extraction of temporary milk molars. Mr. Owen gave them the key of the situation in his paper, for later on he said that by a proper periodical inspection of the milk teeth the dentists might be able to arrange matters. By a proper periodical inspection they never got cavities going on to exposure of the pulp, they never got abscesses, inflamed glands, and that sort of thing; they treated the small cavities when they appeared, and saved the teeth until the time for their loss arrived. Mr. Owen distinctly raised a good many points that had been met by Mr. Storer Bennett in what he (Mr. Paterson) thought rather a serious manner. It was true enough they believed the early extraction of temporary molars crowded the teeth, leading to trouble afterwards; but they did not believe, as Mr. Storer Bennett had pointed out, that it made any difference in the growth of the jaw. The paper must not be taken too seriously. Mr. Owen had been reading a special book, the book of Smale and Colyer, and perhaps had devoted more attention to the treatment of permanent teeth than to that of temporary teeth. He (Mr. Paterson) could not help thinking from his recollection of the book that there was some qualifying statement with regard to the treatment of temporary teeth which had not been quoted, seeing that the quotations made by Mr. Owen and the remarks made by Mr. Colyer did not exactly tally. His object in rising was to prevent the discussion becoming too antagonistic towards Mr. Owen.

Mr. Bland Sutton said he was simply present because he had heard that his friend Mr. Owen was going to interest the Society in a question of some importance. He could always learn something from discussions as to the treatment of children, and he had done so that evening. He knew very little about milk molars, but he had attended that Society, and when he first became assistant-surgeon to a general hospital he thought he was very clever. He used to take cases in the out-patient department and consult with his dental colleagues as to the advisability of extracting teeth when children had enlarged glands, and they used to tell him it was not the teeth which caused the glands but something else in the mouth. For a time he was rash enough to take the matter into his own hands and pull out the teeth himself; but when he learnt more discretion he began to feel that his dental colleagues were right, and for this reason, that when the gland had enlarged the mischief was done, and although the tooth was extracted they subsequently had to enucleate the gland under the jaw. That was a point upon which Mr. Owen might enlighten them—as to whether when the glands under the jaw had become enlarged and the milk molars, which he thought the source of trouble, extracted, the swelling of the glands not in all, but in a fair proportion of cases, subsided. His (Mr. Bland Sutton's) experience was, that they did not. Statements had been made about making all general practitioners very wise about the teeth. The general practitioner was already overburdened; he knew the eye, the skin, all kinds of thing

He should not be pressed too much about the teeth. Mr. Owen had it in his power to produce a very great alteration in the minds of the present generation of students as to their knowledge of the teeth, as an examiner at the Final Board of the College of Surgeons. Those examiners had a greater power for good than they thought they had, and if at the next examination Mr. Owen would set some such questions as those described on the various troubles in the neck, which might arise from troubles in the teeth, he might not get very good papers at that examination, but that day six months there would be a marked improvement.

Mr. Owen, in reply, said he rose with mingled feelings ; first of all his feelings were those of gratitude at being let off so easily ; secondly, his feelings were those of disappointment, because the discussion had not followed the lines of his paper. One of his questions was, what were they going to do with the tooth with a lymphatic gland beneath it, which was large and tender? That was the point which had induced him to read the paper ; but yet it had not been duly discussed. He had a child of his own about five years of age, with a carious lower molar and an enlarged gland. He sent her to a dental friend requesting him to examine it, and if he thought well, to remove the tooth. He sent back the child, stating that he did not think the case should be so treated. Another excellent dental friend was then consulted, and he also would not take out the carious tooth. These two illustrious dental surgeons did not suggest that the tooth should be filled—it was past that—but they declined to extract it, for fear, it seemed, of offending the unseen permanent teeth. The tooth was, however, eventually extracted, and the lymphatic gland promptly subsided, and he believed if it had not been extracted, the gland would have suppurated. That would answer Mr. Bland Sutton's question as to his experience about the removal of carious teeth when the lymphatic glands were enlarged ; it was just a case in point, and they might be sure that he had regarded it with the greatest interest. He would ask if the tooth had been allowed to drift on until it was absolutely rotten, what would have been the good of trying to keep it? It was a constant and tremendous source of infection. It was not correct to say that he advised the ruthless extraction of every carious tooth, and in suggesting it, Mr. Storer Bennett put words into his mouth which he really did not use. He did not wish to extract every carious tooth, but he did want to insist that if one had a carious tooth to deal with, and the child was suffering pain, the game was rarely worth the candle to try and stop it, particularly if there was an enlarged gland beneath the angle of the jaw. Although sometimes, as in the case he had mentioned, on the carious tooth being removed the gland would subside, still there were cases in which, although the tooth was extracted, the gland beneath the jaw required to be excised or underwent softening and suppuration. Mr. Owen stated that he agreed with Mr. Bland Sutton that the general practitioner should not be made very wise over the matter of dentistry ; indeed, all that he desired was that the general practitioner should know how many teeth there were in the temporary set, how many teeth there were in the permanent set, and something as to the time when they were erupted—that was all. With regard to Mr. Cunningham's remark's as to his "missionary enterprise," that gentleman appeared to allude rather bitterly to some Society which had asked someone to read a paper, and then declined to receive it. He was sure that if a qualified dental surgeon asked any Society of medical men to be allowed to read a paper, the Society ought to be duly grateful, but it must not be on such a subject as "mastication ;" it must be on some topic which was interesting to the medical members as well as to the dental element which would flock to the Society on that occasion. Mr. Cunningham had read him a little lesson about the physiology of molars. He might not quite know what the exact physiology of the molar might be, but he was sure that if there was a carious molar with an exposed pulp, it was something worse than absurd to expect that the child would use it "physiologically." It would not eat on that tooth, and on examination it would be found that the molars in the neighbourhood were covered with a yellow fungus, showing that that side of the jaw was not used at all. The tooth was no use, and was absolutely harmful. He would not deny that a crowding of the permanent teeth might be produced if some of the temporary teeth were removed, but in such a case a periodical inspection would enable them to keep the teeth right. He had seen what could be done by putting the crowding teeth right, but surely they were not going to leave a carious, gland-infecting tooth in order to prevent a crowding of permanent teeth, which could easily be put right by judicious manipulation. The difficulty of supervision had been alluded to, and no doubt it was very great. He fully approved the idea of getting at the pulp, destroying it with strong carbolic acid and then putting in some fluid stopping. Strong carbolic acid was an extremely valuable antiseptic, and if every pulp could be thoroughly destroyed he had no objection to the tooth being filled but it must be thoroughly done. He was afraid that this infection of the gland was tuberculous. First of all the vitality of the gland was lowered by the irritation of the tooth and this lowered vitality predisposed the gland for the germs of tuberculosis. He thoroughly agreed with the idea of consultation between the surgeon and the dentist, it was really most desirable. The dentist did not always look with the eye of the general surgeon below the jaw, and the surgeon was not as conversant with the methods of his dental *confrere* as he should be. He was quite sure that rotten useless teeth ought to be removed, and that it was only a few teeth which would lend themselves to stopping, and should be treated in a conservative manner.

Dental News.

VACANCY.

The Victoria Dental Hospital of Manchester. The post of House Dental Surgeon is vacant. Applications with testimonials to be forwarded to the Honorary Secretary.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the "British Journal of Dental Science."

Dear Sir,—Can you give me a short space to place the following question before your readers?

If a man has served his articles of apprenticeship to a qualified practitioner, and paid a premium, and having obtained the £5 stamp as the sanction of Somerset House, in which indenture is particularly specified by the master, that in consideration of a given premium, he undertakes to teach the pupil the principles and practice of Dental Surgery (the indenture being duly drawn up legally through a solicitor's hands), is not that pupil at the expiration of such time fully entitled to call himself a Surgeon Dentist? I hold that he is entitled, since Somerset House has agreed that the master of the pupil is a fit, able, and proper person to undertake the responsibility of teaching and instructing that pupil, in fact to transform that pupil into a Surgeon-Dentist at the expiration of the apprenticeship. If that pupil be not a Dentist, what is he?

Yours truly,
DIFFICULT QUESTION.

Devonport, Sept. 7, 1894.

⁂ Our correspondent appears to place too high an opinion upon the "sanction" of Somerset House. He would perhaps strengthen his case by quoting section 37 of the Dentists' Act.—Ed.

To the Editor of "The British Journal of Dental Science."

Sir,—I notice the correspondence now going on in your columns anent a modified examination. Your correspondent "Dental and Conjoint Student" seems himself to be a little muddled; there are no modified examinations at all. Whether the student be *sine curriculo* or *cum curriculo*, precisely the same examination must be passed by both. It seems to me, Sir, a great pity that so much importance should be attached to the degrees a man possesses rather than to his ability, and here let me say that ability to pass an examination is one thing, but ability at the chair is quite another. I can quite endorse what "Enquirer" states. I have employed assistants possessing the M.R.C.S.; L.R.C.P.; L.D.S., &c., whose work was discreditable in a high degree. One of these I could keep but a week or so, yet a few weeks subsequently I found he was appointed on the Staff of one of the Hospitals as a demonstrator forsooth! I pity the demonstratees! After a very long experience and without the slightest bias, I have come to the conclusion that the plain L.D.S. is (taking all else into consideration) a usually much better practical dentist than the M.R.C.S.

I am, &c.,
D.D.S.

To the Editor of "The British Journal of Dental Science."

Sir,—I have read with curiosity letters by "Registered Dentist" and others. Let me tell "Registered Dentist" that I for one do not consider myself a whit inferior to all the L.D.S.'s put togethsr! Why should I? The Act legally entitles all reglstered men to practise "Dentistry and

Dental Surgery," and if I were an L.D.S. a hundred times over I should possess no corresponding legal advantages; as I could not then (any more than now) fill in death certificates, unless possessed of a Medical or Surgical qualification! What on earth does "Registered Dentist" grieve about?

Now instead of crying about an *unnecessary* "Modified curriculum,'' or what not, let "Registered Dentist" and all registered men do what is so *greatly needed just now*, viz., look up all *unqualified* practice, whether by individuals or quack firms; also, all unregistered men acting as Assistants; also, all registered men "covering" unqualified practice or practices,

The Medical Council issued (about two years since) a Memorandum notifying that Registered Practitioners would be deemed guilty of "infamous conduct," &c., if they employed unregistered men to perform any operation in dental surgery. Surely it is quite time the Registrar took action. The Memorandum as well as the Act seems obsolete! *Let us act!*

Your obedient Servant,
ANOTHER REGISTERED DENTIST.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
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GENERAL PATHOLOGY AND SURGERY FOR DENTISTS.

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F.R.C.S. (Eng.)

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(*Continued from page* 877.)

SYPHILIS.

Syphilis is a constitutional disease which may be inherited by children from their parents, or may be acquired by local inoculation from another person afflicted with the disease.

Acquired Syphilis.

The site of inoculation is usually the genital organs. The disease first makes its appearance about three to five weeks after the exposure to contagion. In the male the *primary sore* is most commonly found just behind the corona glandis, in the female inside the labium. The most typical variety of primary sore is the *Hunterian chancre* ; this begins as a small papule which develops into a definite raised nodule with a flattened, glazed and sometimes excoriated surface, and a densely indurated base, so that when grasped between the fingers it feels like a piece of gristle. The development of the primary sore is the result of implantation of the syphilitic virus. The nature of this virus is not at present exactly known, but it is almost certainly some form of micro-organism. Other kinds of sores frequently occur on the genital organs as the result of impure connection; they are called *chancroids* or soft sores, and have nothing whatever to do with syphilis.

The primary sore of syphilis is not by any means always found on the genital organs. There is scarcely a spot on the body on which such a sore has not been occasionally seen, but the commonest situations for these so-called *erratic chancres* are the lips, the nipple, and the finger of the accoucheur. They are also met with on the tongue and tonsils. A chancre has been known to occur on the gum after extraction of a tooth with infected forceps.

The primary sore will not have lasted long before the poison extends along the lymphatic vessels to the nearest lymphatic glands (usually, of course, those in the groin). These become enlarged and indurated, but remain separate from one another, and free from pain or tenderness. They are usually described as feeling amygdaloid or shotty. So far, the poison has not gained admission to the general circulation, and the infection is local; within, however, about six weeks to two or three months, the infection becomes general, and results in the appearance of so-called secondary manifestations.

Secondary Syphilis. The virus is now at work in the blood, and produces various affections of the skin, mucous membranes, and other structures. The earliest skin affection is a *roseola* over the chest and abdomen; this eruption is scarcely more than a mottling of the skin, it is due to congestion of the surface capillaries and fades on pressure. Roseola is often succeeded by a scaly eruption called syphilitic *psoriasis*; this occurs on the face, chest, and flexor aspects of the limbs; it must be distinguished from ordinary psoriasis, which is much more scaly, and occurs chiefly on the extensor aspects. *Condylomata* occur in situations where the skin is moist, as about the mouth and anus. They are small flattened elevations of a pale rose, or whitish colour, and moist shining aspect, about the size of a split pea, or larger; they are very contagious and infect neighbouring portions of skin with which they come in contact. When situated between the toes they are prone to ulcerate, producing *rhagades.* In some cases of secondary syphilis one sees *papular* eruptions (small pimples), and *vesicular* eruptions (tiny blisters). The contents of the vesicles may become purulent; they are then called *pustules.* The larger pustules may dry up, and form scabs, beneath which ulceration may occur; as the ulceration extends, larger and larger scabs are formed, producing a graduated crust resembling a limpet shell. This condition, (which is called *rupia*) occurs in the later stage of secondary syphilis in those who are broken down in health.

All secondary eruptions have the following characters in common, viz., they are more or less the colour of copper or lean ham; they are arranged symmetrically on the two halves of the body, and they are often polymorphic, *i.e.*, several varieties co-exist. The commonest secondary syphilitic affection of mucous membrane is the *mucous tubercle.* These tubercles appear as slightly elevated whitish patches, and are most commonly found on the tongue, cheek, lips, palate and tonsils. They consist of sodden epithelium infiltrated with inflammatory cells. Portions of the patches are prone to die, producing superficial ulcers.

During the later stages of secondary syphilis, other parts are not unfrequently affected; the lymphatic glands all over the body, especially those at the back of the neck, become enlarged, and the bones, joints, eye and testicle may become inflamed.

Tertiary Syphilis. Under this title are included a number of lesions which may occur at any time after the end of the secondary stage. Usually they do not appear within a year of the primary infection, but sometimes may occur early enough to overlap the secondary stage. They may not occur until many years have elapsed. The essential lesion of tertiary syphilis is the *gumma.* Gummata are composed of granulation tissue (*i.e.*, inflammatory cells). The cells in the centre of the gumma undergo fatty degeneration from want of blood supply, and may become converted into a caseous mass (see Fig. 8). Frequently the whole gumma dies, forming a slough resembling a piece of wet wash-leather, and which on separation leaves a deep ulcer. Gummata may vary in size from a pea to an orange or even larger, and may be situated

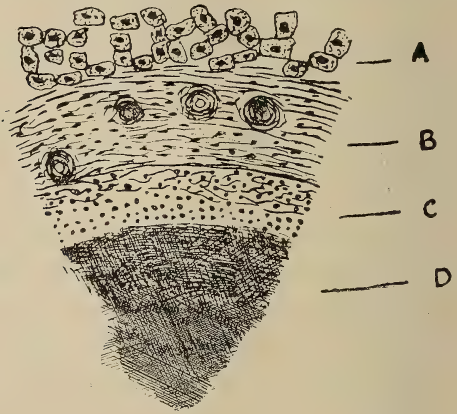

Fig. 8.

GUMMA OF LIVER.

A.—Normal Liver Tissue. B.—Leucocytes containing small vessels with thickened walls and narrowed lumen. C.—Leucocytes in reticulated matrix. D.—Caseous structureless material. Mag. 350 diam. (Drawn from nature by H. K. Gordon).

in any part of the body. They are most commonly found in the following parts:—

In the subcutaneous and submucous tissues, producing ill-defined, roughly spherical lumps, which have a great tendency to break down and form deep circular ulcers.

In the periosteum, producing *nodes.*

In bones, leading to caries and necrosis.

In muscles, producing lumps, which are apt to be mistaken for tumours.

In the skin, producing little lumps (*tubucular syphilide,*) and terminating in a creeping (*serpiginous*) form of ulceration.

In the tongue, producing scars and furrows, sometimes terminating in cancer.

In the brain, spinal cord, and nerves, producing paralysis and other nervous phenomena.

In the arteries, causing aneurism, etc.

In the viscera (liver, lungs, etc.), producing many different symptoms.

All gummatous affections have the following characters in common:—they are chronic in their course: they have no tendency to heal; they are prone to break down; they are not contagious; they are usually not arranged symmetrically.

Treatment. The primary sore should be kept clean by an application of black wash, and protected from irritation. No other local treatment is of any use. During the primary and secondary stages mercury must be administered either by the mouth, by inunction, by fumigation or by subcutaneous injection. In most cases the best way to give mercury is in the form of pil. hydrarg. cum creta, in doses of 2½ grains three times a day. The course of mercury should extend over six months, or longer if the secondary manifestations have not disappeared in that time. When a patient is fully under the influence of mercury, the edges of the gums are slightly reddened and there is slight tenderness on biting. If the drug be pushed further, profuse salivation and even necrosis of the jaw may ensue ; should salivation occur, the drug must be withheld, a slight purge administered and the mouth rinsed out frequently with a 1 per cent. solution of chlorate of potash. Condylomata should be dusted over with a powder composed of equal parts of calomel and oxide of zinc. Mucous tubercles about the mouth may be treated with black wash or a 2 per cent. solution of chromic acid. In the tertiary stage, iodide of potassium in doses of from 5 to 15 grains three times a day should be administered. Gummatous ulcers should be dressed with an antiseptic application such as iodoform, red oxide of mercury ointment, &c.

CONGENITAL SYPHILIS.

Syphilis may be inherited either from the mother or from the father. In the former case, the ovum may be syphilitic when impregnation occurs, or may become infected subsequently through the placental circulation ; in the latter case the ovum becomes syphilised by the spermatozoon at the time of impregnation. Infants may acquire syphilis by coming in contact with infecting sores during birth, but syphilis acquired in this way is not strictly speaking congenital. The child usually appears quite healthy when born, and remains so until it is four or five weeks old. The symptoms which occur then are a catarrhal condition of the nose (*snuffles*), a rash over the body and mucous tubercles about the mouth and anus. The rash is best marked about the nates and genital organs, where it is usually erythematous in character. It may, however, closely resemble any of the rashes of acquired secondary syphilis. In most children the general nutrition suffers very much, so that they become wizen and shrunken, looking more like monkeys than human beings. The wasting (*marasmus*) often ends in death. Under treatment all secondary phenomena usually disappear within a year. In some cases no further symptoms occur, but in many of them after a longer or shorter time, tertiary affections appear ; the most important of these are interstitial keratitis, inflammatory affections of bone and periosteum, chronic synovitis of joints, gummata, ulceration of the palate, and deafness. In a marked case of congenital syphilis some, or all, of the following appearances may be present : 1. The bridge of the nose is depressed and broad, the result of the infantile catarrh. 2. There are radiating scars about the angle of the mouth, the result of previous ulceration. 3. The skull is large and either surmounted by natiform or hot-cross-bun-like swellings (*Parrot's nodes*) or extremely thinned in places (*craniotabes*) ; the forehead is high and square. 4. The permanent upper central incisors are dwarfed and narrowed towards the cutting edge, which presents a well-marked crescentic notch. 5. The stature is stunted.

Treatment. In the early stages, mercury should be administered by inunction, half a drachm of unguentum hydrargyri being put on a flannel binder and fastened around the child's waist every day. The feeding must be carefully attended to, and if the mother cannot suckle the child, it must be brought up by hand. The services of a wet nurse are inadmissible, as she would run great risk of acquiring a chancre on the nipple. It sometimes happens that a mother who has given birth to a syphilitic child shows no signs of syphilis herself ; such a one may suckle her child without risk of becoming infected. This is known as Colles' Law. The results of treatment of congenital syphilis by mercury are usually most satisfactory. In many cases no tertiary phenomena ensue. When these do occur they should be treated in the same way as in the acquired disease.

TUBERCULOSIS.

Tuberculosis results from infection by a micro-organism called the tubercle bacillus. The essential lesion in tuberculosis is the development of tubercles either in a single organ or tissue (local tuberculosis) or throughout the body (general tuberculosis). The bacillus of tuberculosis may enter the body by means of (a) *the digestive tract*; by eating imperfectly cooked tuberculous meat, by drinking milk from tuberculous cows; and by direct infection from the sputum of phthisical persons. (b) *By the respiratory tract*; by inhaling dust impregnated with dried phthisical sputum. (c) *By the skin* by direct inoculation. It appears that tubercle is only rarely inoculated in this way and that even when inoculated it remains local and does not affect the general system. It is quite possible that the bacillus may affect the glands of the neck by having gained admission through a carious tooth.

In tuberculosis, as in all other microparasitic diseases, the vitality of the host must be lowered before the bacillus can gain a footing. The chief *predisposing causes* producing the necessary condition of lowered vitality are :—

1. *The strumous diathesis.* This name is used to designate a general state of nutrition or constitution which is peculiarly suitable for the development of tuberculosis. Two distinct types are usually described; in the first known as the *sanguineous* or *serous*, the skin is fair and thin, the hair blonde or auburn, the features delicate, the eyes blue, the lashes long and silken, the intellect active and often precocious; in the second known as the *melancholic* or *phlegmatic* the general aspect is dull and heavy, the skin is thick, muddy and harsh, and the mind sluggish. In strumous subjects slight injuries are prone to produce inflammatory conditions characterized by great chronicity, feeble power of repair and tendency to caseation of the inflammatory products. By some

pathologists these "strumous" inflammations are thought to be the result of actual deposit of tubercle and not of the general state of nutrition. Be this as it may, it is quite certain that some people (usually called strumous) although not actually tubercular are very prone to become so. It should be added that some authorities use the terms "struma" and "tuberculosis" as identical. This custom is to be regretted as it leads to confusion. It is better to apply the term "tubercular" to those who are actually afflicted with tuberculosis, and "strumous" to those who, although not actually afflicted, are in a condition of general health which predisposes to it. The term "scrofulous" largely used by the older writers is now used synonymously with "strumous" and had better be entirely discarded. The manner in which the strumous diathesis is produced is not fully understood ; but it appears that it is often inherited from tubercular parents, and is apt to occur in the children of very young or very old, or dyspeptic or perhaps syphilitic parents.

2. *Bad hygienic surroundings.* Such as poor food, damp, imperfect ventilation, etc.

3. *Youth.* Tuberculosis, although occasionally met with in old people, is almost entirely a disease of children and young adults.

4. *Injury.* The development of tubercular disease in a bone or joint is often determined by some slight injury which in a healthy person would produce no permanent evil result.

Structure of a Tubercle. Two varieties of tubercle are usually described, viz., the *grey miliary tubercle* and the *yellow or caseous tubercle,* the latter, however, is not a distinct variety, but is simply a degenerated caseated mass of miliary tubercle.

The miliary tubercle is globular in shape, varying in size from a pin's head to millet or hemp seed, and closely resembling a tiny nodule of cartilage in appearance, being hard and semi-translucent. When examined under the microscope it is found to consist of a central giant cell containing many nuclei; from the giant cell processes radiate out forming a reticulum or network in which are enclosed a number of cells. Those in the immediate vicinity of the giant cell resemble endothelial cells and are called "endothelioid"; the others are simply leucocytes, (see Fig. 9). A tubercle contains no blood vessels, and is consequently very prone to undergo caseous degeneration. By appropriate methods of staining, the tubercle bacilli can be demonstrated in the giant cell and the surrounding endothelioid cells. Various explanations of the structure of tubercle have been given by different authorities at different times. It seems probable that the

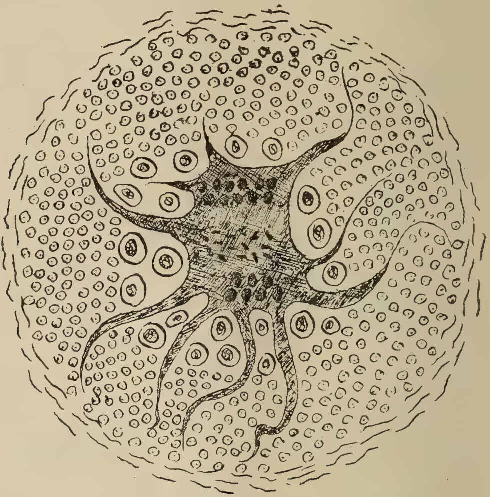

Fig. 9.

DIAGRAM OF A TUBERCLE.

In the centre is a giant cell containing tubercle bacilli and many nuclei. Around this are several endotheloid cells, outside which again are numerous leucocytes.

cluster of cells which constitute a tubercle are really phagocytic in nature, their aggregation constituting an attack upon the invading bacilli. The giant cells and endothelioid cells are probably of connective tissue origin, and the small round cells are derived from the blood.

There is scarcely any part of the body which is not at times affected with tuberculosis, but there are certain localities which are especially prone to be affected ; these are the lungs, bones, joints, serous membranes and lymphatic glands.

The presence of tubercle in a tissue always sets up a certain amount of inflammatory reaction, in some cases, with the fortunate result that the tubercular deposit becomes encysted in a fibrous capsule, and is so rendered practically inert ; it may then undergo caseation, and subsequent calcification. In other cases, the caseated tubercle may soften and form the focus of a chronic abscess, the necessary result being severe damage to the tissues ; thus in bone disease caries usually results, in phthisis (pulmonary tuberculosis) the lungs become hollowed out with large suppurating cavities, etc.

Symptoms. The symptoms of tuberculosis are necessarily extremely varied, as any organ or tissue in the body may be affected. It may be stated generally, that in the early stage of a tubercular lesion, the symptoms are chiefly those of irritation, and that in the later stages they are the result of destruction of tissue.

Treatment. The general principles of treatment of tubercular lesions are (*a*) to improve the general health in every possible way, so as to increase the resisting power of the tissues, (*b*) to provide mechanical and physiological rest for the affected part, and (*c*) to remove the diseased parts, when they are beyond the reach of natural repair, by excision, amputation, evacuation of abscesses, scraping, etc.

VULCANITE WORK.

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(*Continued from page* 892).

GUM SECTION WORK.

Up to this point reference has been made only to the employment of the ordinary flat or vulcanite teeth, using, for the artificial gum, the pink rubber as sold at the depots.

If the patient does not expose the gums when talking, or laughing, this method of working answers very satisfactorily.

Many patients, however, present themselves to our notice, who show not only the whole of the front teeth, but a large portion of the gums also. In such cases the presence of the rubber would be objectionable, so one finds it necessary to use what are known as "gum section teeth."

One cannot imitate the colour and translucency of the natural gums with an opaque substance such as hard rubber, but such a result can be accomplished by the use of gum sections.

These sections represent teeth with the gums attached, and are made of dental porcelain. A set of fourteen gum teeth is usually divided into six sections, and great care is required in fitting them, not only to conceal the joints, or divisions between the sections, but also to get a perfect arch.

They should be mounted on a matrix plate, such as would be blown up in the Steam Swager, or on a plate sufficiently rigid that the sections are not liable to be displaced when the case is tried in the mouth. It is perhaps the best plan to fit and adjust the upper sections first, having previously fixed the lower "dummy" composition bite on the model to act as a guide.

The upper teeth and gums are usually the most conspicuous, and by adjusting these sections first, a little more latitude can be obtained than if the lower teeth were present.

The edges of the two sections forming the front joint should be ground perfectly parallel, but the joint between the canine and bicuspid on each side, should slant from the distal edge of the canine backwards, (see Fig. 14.)

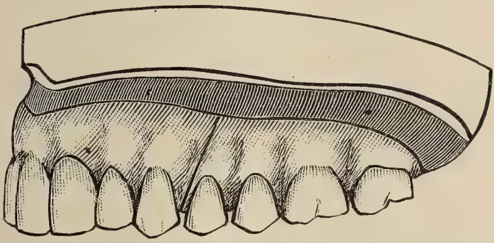

Fig. 14.

This arrangement will in a great measure conceal the joint in this region, by its being posterior to the canine eminence.

It will also permit of the bicuspid assuming a more natural position in regard to the canine.

When jointing gum sections, it is necessary to keep them perfectly steady against the flat side of the corundum wheel ; this latter should run perfectly true and be kept wet.

As each section is fitted, the inner angles should be ground off, this will make a space, into which a wedge-shaped piece of vulcanite will go and so make the case much stronger.

When the upper sections are fitted and fixed in position on the matrix plate, the lower sections may be fitted to them in a similar manner.

After the cases have been properly waxed up, the polishing plate should be adjusted to the upper, and the pieces are then ready to be placed in the flasks, in the same manner as previously described for an edentulous set.

After the insertion of the case in the flask and the removal of the wax, the joints may be cleaned by rubbing them with a little wool moistened in chloroform.

Some thinly mixed plaster of Paris should now be inserted in the joints, in order to prevent the rubber being forced between, and so rendering them more conspicuous.

Care must be observed in packing-in the rubber to avoid a surplus, and also in closing the flask after boiling out.

This work if neatly done has a very pleasing and artistic appearance, and as a rule patients are very well satisfied with it, the colour of the porcelain gum approaching so closely to the natural as to deceive the ordinary observer.

In the selection of gum blocks, we must be guided by the shape, colour, and length of the natural teeth that have been extracted.

One reason for the direction to mount the blocks on a matrix plate, such as would be blown up in the Steam Swager, is that by so doing the cases can be tried in the mouth with safety, and any defect altered.

After vulcanizing, the cases are finished up in the same manner as for ordinary work, and should any discolouration appear between the joints of the blocks, it may be removed by the application to it of a little pure nitric acid.

The disadvantages of gum sections are :—

1st. That one cannot, without having some thousands in stock, get a set that will at the same time approximate both in size and shape of teeth, and contour of gum, to the case one wishes them for.

2nd. One cannot give expression to each individual tooth, but is hampered in this respect by the stiffness incidental to the teeth being joined together, and by having not only to fit the alveolar ridge, but also to make the joints perfect.

3rd. When one has to fit the gum teeth to a prominent alveolar ridge, they have to be ground thin in order to prevent the protrusion of the upper lip. They are then not of sufficient strength to withstand the wear and tear of use. Such a combination can only be obtained by a continuous gum facing on a platinum plate.

SUCTION VULCANITE WORK.

The term suction should be applied only to a case that adheres to the roof of the mouth without the support of clasps, springs, or fastenings of any kind.

It must not be wedged or fit tightly in between the natural teeth, nor must it be attached to roots by pivots or other fastenings. The mouths most suitable for suction work are those that are perfectly edentulous.

To obtain the best results the whole of the hard palate, (as well as the labial and buccal surfaces of the alveolar border,) extending to just behind the tuberosities should be covered by the base-plate. Any departure from these conditions, such as fitting the front teeth on the natural gum and thus breaking the continuity of the matrix plate is, (although the case may answer well enough in some instances) detrimental to its thorough effectiveness.

The adhesion of a case to the roof of the mouth is influenced in two ways.

First, by its perfect adaptation, and the pressure of the atmosphere, producing what is termed suction.

Secondly, by another element that must also be considered, and that is the peculiarly adhesive nature of the secretions of the oral glands, which will often, (although the fit of the case be defective) retain it in position.

The suction of a case is often weakened by the plate pressing unduly on certain parts of the mouth, such as where the attachments of the buccinator muscles are inserted, also on the centre of the hard palate when it is very pronounced. This latter can be accounted for when making the case, by placing over the part, on the model, a thin piece of plate prior to making the matrix plate. It is also greatly affected by the position of the teeth; the more projecting they are, the greater likelihood there is of the case being displaced. The teeth, molars and bicuspids especially, should spring from the centre of the alveolar border, and the greatest pressure should be in that region. In giving an opinion as to whether a case is likely to prove successful or not, we must be guided in a great measure by the presence or absence of the lower teeth. If the six front teeth are the only ones *in situ*, and the patient does not contemplate having a lower case, it would be seriously detrimental to the stability of the upper case if all the pressure were upon the front teeth, as there would be a great tendency to tilt the case and loosen it from the back of the palate.

The presence of eight teeth in front will answer, provided one gets a distinct upward pressure in the bicuspid region, but perfect results must not be looked for, unless we have fair pressure, such as would be produced by the presence of the lower molars. If these teeth are not present in the mouth the patient should be made to understand that the success or non-success of the case will in a great measure depend upon these considerations.

I have already described two kinds of suction, one the result of a perfect fit, another the result of the adhesive nature of the oral secretions, and I would yet add a third means by which the suction of a case may be increased, and that is by a series of linear markings on the model, (see Fig. 4) the object of which is to produce on the finished case slight elevations, that will, so to speak embed themselves in the soft mucous membrane of the alveolar ridges and palate, converting the whole case as it were into a large suction chamber. The object of such markings is to prevent any slight displacement from affecting its holding power. I feel sure that most successful results are obtained by these means.

The production of a vacuum by means of a suction chamber for the retention of a case can be relied on only so long as that chamber retains its effectiveness and does not become filled up with the soft mucous membrane. When this does take place it is indicative that the suction chamber could have been dispensed with altogether.

Valves or discs to aid in the holding of a case in the mouth should be only used in exceptional cases, and where employed precautions should be taken that the cavity in the plate is slightly larger than the rubber disc to be used. Otherwise the rubber after a time expands and spreads over the edges of the chamber, cutting into the palate and making it sore.

When a rubber disc is used the patient should be instructed how to remove the old and to put on a new one, and should be supplied with a number for that purpose.

The depth of the chamber in the plate should correspond with the thickness of the rubber, and the stud for the attachment of the disc should be on a level with the edges of the chamber, so that it does not press or touch upon the hard palate. The rubber disc when placed on the stud should assume a cup form, so that the thin edges press upon the palate and spread out, and are easily compressed up into the chamber. If these discs are worn intelligently no bad result can take place, but if the patient neglects them, then they not only become offensive but harmful. Full instructions should be given the patient concerning their use.

These discs may be used when a metal plate is worn, and, either from the presence of stumps or other causes, the suction is imperfect.

The discs may be made either of soft vela rubber, moulded and vulcanized, or what is equally serviceable, a disc may be cut out of a sheet of ordinary white vulcanized rubber by a gun punch of the proper size, viz., slightly smaller than the chamber in the plate.

The edges of the disc must be bevelled thin with a sharp pair of scissors, and a hole punched through the centre. The disc may be further weakened by having thin sections cut, out of the surface, running from the centre to the circumference.

This bevelling and weakening of the disc reduces its stiffness, and so allows of its going up into the chamber without too much pressure on the palate. The small hole in the centre is for fixing it on to a stud which has been previously vulcanized in or rivetted in, the chamber.

To illustrate the use of linear markings the following case may be taken:—

Mrs. H. This patient was wearing a temporary vulcanite set, which answered very well, although it was inserted in the mouth two days after the extraction of the teeth. It no longer fitted, owing to absorption of the gums, so she thought she should like a gold upper suction set if it could be made. A case was therefore constructed with six flat teeth mounted in front and tube teeth at the back, flat teeth being put on in front owing to the closeness of the bite. This new case had two defects: first, it did not fill out the lips and cheeks sufficiently; and secondly, it did not hold in the mouth as firmly as the vulcanite set. I therefore removed the tube teeth, and with a sharp thin wheel on the dental engine, grooved them at the sides, so that the rubber which I intended to mount on the labial aspect of the plate might be able to run in between them and hold them in position. After I had trimmed away the buccal and labial edges of the plate to the required size, I made, with a fret-saw, a series of nicks extending into it one-sixteenth of an inch ; these saw marks extended completely round the case. The plate was then replaced on the model, and with a sharp pointed broach, a line was made corresponding with the exact size of the plate.

The plate was again removed, and another groove, or mark, was etched into the plaster model, one-sixteenth of an inch within the circumference of the first marking. The tube teeth were now replaced and fastened on with sulphur. The plate was then replaced on the plaster model and waxed up round the buccal aspect, as much as was needed to restore the contour of the features, and a much smaller quantity of wax to just cover the posterior edge of the plate, and conceal the saw marks made therein. This case was inserted in the flask on the model, and packed with rubber in the ordinary way, and when finished it represented a gold plate with rubber in front, and an extremely narrow rim round the back. Formed by this rim of rubber were the lineal markings spoken of previously, when referring to vulcanite suction work.

It was found that the sulphur which cemented the tube teeth to the plate had not been destroyed, but if this had occurred provision was made for retaining them in position by the grooves which were cut in their sides for the rubber to run into and clasp them.

The fit of this case was in every way excellent, and the expression of the features all that could be desired.

(*To be continued.*)

A FEW HINTS ON PIVOTING.

By Edward G. Carter, L.D.S. Eng., & Glas.

As a good deal has been said of late respecting the different methods of pivoting, and their advantages and drawbacks, I venture to give a little of my experience in this special branch of dentistry. As a result of some years' study, I have come to the conclusion that a great many of the failures are due to the thinness of the pins, the latter often breaking off short in the root canal. To obviate this failure, my method is to get the canal as large as possible without impairing the strength of the root; I then make my pivot pin as nearly as possible the diameter of the canal, and by this means a maximum thickness of pin with a minimum quantity of cement is obtained. I find this method a great boon in the case of very short canals, where a thin pin would be next to useless, a thick one overcoming any strain to a much greater extent. Most operators will recall what is often seen in the case of laterals. The following is the way I prepare the root canal prior to taking the impression.

1. The canal having been rendered aseptic, is enlarged as much as possible to a cone-shape, the surface of the root being trimmed to the gum in the usual way.

2. The canal is next mopped out with vaseline, and filled with temporary gutta-percha.

3. A small French nail, finely tapered and warmed, is then inserted gently into the gutta-percha in the root canal cavity, the head just projecting.

4. The impression is then taken with A1 composition, and when set removed, bringing the pin away with the gutta-percha intact. Having cast the model and removed the composition, the head of the pin is heated, when the gutta-

percha is readily removed from the root canal thus leaving an exact impression of the latter in the model.

V. A pin is then made as nearly as possible the same size as the canal, and as regards the material for the pin, I use the best dental alloy. This method of pivoting is applicable to incisors and canines.

THE ANTISEPTIC PROPERTIES OF FORMOL.

At the meeting of the Paris Academy of Sciences last week, M. Friedel read a paper, by M. Trillat, concerning experiments that have been made on an extensive scale with regard to the antiseptic properties of methylic aldehyde vapours (commercial formol). M. Trillat did not use solutions of formol for producing the vapours, but the producing-apparatus which converts the methylic alcohol directly into formol. He tested his apparatus in rooms varying in size from 20 to 300 cubic metres, the walls having been covered with germs of very resisting nature at different heights. Various infected articles were also placed in the apartments. The results allowed the conclusion to be formed that the vapours took effect equally well both as regards height and depth. The force of penetration of these vapours appears to be so great that, although they were used to an almost infinitesimal degree, drapery infected with germs was entirely purified, the various septic agents contained in it being destroyed. Even wood was penetrated to a considerable depth, and M. Friedel drew attention to the fact that similar results could not be obtained by the vapours of any other substance.

Chemist and Druggist.

British Journal of Dental Science.

LONDON, OCTOBER 15th, 1894.

THE NEW SESSION.

So far as the Preliminary examination in General Education is concerned, the Medical and the Dental Student start on the same footing; and as the Dental curriculum demands an attendance at a General Hospital, both are made equally welcome and receive the same words of advice at the commencement of a fresh year's work. Apart from the benefit which each of these classes of students may derive from association with the other, we must believe that the scientific training and the general surgical teaching is productive of good to the future Dentist. The introductory addresses delivered at several of the schools this year, appear to have run on much the same lines as usual. References were made to professional politics, to the relation of the profession to the public, to the abuse of hospital charity, and kindred topics; but there were thoughtful utterances, having a broader bearing, which afforded useful food for reflection to students of a scientific profession.

The words "science" and "scientific," for instance, received consideration in Dr. Owen's address at St. George's. ' Scientific " does not necessarily mean something done with a test-tube, a microscope, or a scalpel. In a rational sense the terms define a method, not a subject or a place of study; and the speaker proceeded to point out the importance of accurate observation. Although every one thinks he possesses this power, it is in reality seldom found except as the result of some special training. Dr. Owen thinks that the best way of acquiring this habit is "the old-fashioned one still followed in the London schools : the constant close personal observation of case after case under skilled supervision," and the recording of what is observed. It would, no doubt, be well if the practitioner in after years could make the time to keep up this practice of systematically writing down, or graphically representing, the results of his observations.

At St. Mary's Hospital, Dr. Spicer presented a series of tables which showed that the proportion of medical practitioners to the population has progressively increased during the last twelve years, and his facts, taken in association with the after-remarks on the subject of specialism, seem to us to have a special bearing upon the future of dental practice. There can be little doubt but that, already, men who would have entered hospital with a view to becoming general practitioners are entering the dental ranks. This is partly due to the increasing social recognition of our professional standing, which itself has, no doubt, been indirectly brought about by the institution of a preliminary examination, and other regulations, strictly comparable with those demanded for the practice of medicine.

The Deans of the various Schools have no doubt been busy lately, and, in the keen competition existing, it is to be hoped that in answering enquiries they have been able to resist making disparaging references to opponents, contenting themselves with extolling their own excellent arrangements.

The Hospital has reported the results of a personal inquiry amongst the Deans of the Medical Schools, from which it appears that there is now more consolation for the anxious parent than in former times. The authorities do all that is possible to keep in touch with the students, and their home-life whilst residing in London is a matter of much consideration. In connection with many of the Hospitals there is a residential college, and in the absence of this system it is recommended that the student should live in the family circle of a medical man. At some schools also, a report is regularly furnished to the parent or guardian as to the progress the student is making. Professor Horsley, we notice, spoke strongly in favour of a State degree with a uniform examination conducted under the direction of the General Medical Council, and this we are optimistic enough to believe will sooner or later come about both for Medical as well as Dental diplomas. Higher qualifications could still be left open for those willing and able to take them.

EXPLOSIVE MIXTURES.—*The British and Colonial Druggist* has called the attention of its readers to the danger of certain compounds which are frequently prescribed. Some of the drugs are continually being recommended or used by dentists, and it may be well to remember a few of the points mentioned. Chlorate of Potassium should never be mixed in the powdered state with organic substances, and when combined with tannin, as for instance for use in the mouth, the two drugs should always be dissolved separately. Chlorate of Potassium and Glycerine alone should not be prescribed nor should it be combined with sulphur. Permanganate of Potash also readily gives up its oxygen, and is another source of danger. It should not be mixed with organic bodies such as sugar or glycerine, nor with alcohol. Glycerine, in addition to the above-mentioned cases, should not be combined with chromic acid; nor with borax together with alkaline carbonates. Iodine in the free state should not be mixed with any preparations containing free ammonia, especially when combined with fatty matter.

MILK AS AN ARTICLE OF DIET.— The question as to whether raw milk is better than boiled milk, seems to depend upon the class of cases in which it is administered. Some think it is more digestible, but the late Dr. Randolph, of Philadelphia, some years ago tested the matter by experimentation upon a number of healthy men. Half of them drank raw milk, the others a similar quantity of cooked milk. After allowing a certain time for digestion, the whole were treated by a hypodermic injection of apomorphine and the vomited contents of the stomach carefully examined. It was found that in every case the raw milk was better digested. Crolas, however, thinks that boiling increases the quantity of the free soluble phosphates, and does not injure the milk as a food. Probably raw milk is more digestible for the healthy subject, but in certain conditions, such as diarrhœa, it is preferable to resort to boiling. For preservation, M. Villon recommends that it should be kept with oxygen under a pressure of two atmospheres.

DENTISTRY IN THE TRANSVAAL. According to information supplied by Mr. Quinn, L.D.S., of Johannesburg, the Volksraad has recently ratified a new arrangement in regard to medical and dental practice in the Transvaal. No person in the Republic is allowed to have himself advertised as Medical Practitioner, Surgeon, Dentist, Apothecary, Chemist or Druggist, unless his name appears in the Register of the Medical Board, and his admission fee has been paid. We presume the same rule applies to any person who may wish to use such title without *advertising* it in the usual acceptation of the word. Contravention of this regulation will be punished with a fine of from £10 to £100, and, as if to show the Volksraad mean to be obeyed, it is ordered that in case of non-payment of the fine, imprisonment with or without hard labour for a period of from one to six months will follow. The other financial arrangements oblige medical men and dentists to take out a licence during the time they carry on their profession within the Republic, the cost of which is as follows :—for one year, £25, for nine months, £20, for six months, £15, and for three months, £10.

DEATH UNDER CHLOROFORM.—The daily papers contain the account of an inquest as to the death of a bookbinder, aged 50. He was suffering from advanced cancer and required an anæsthetic for the removal of several teeth which were causing irritation and pain. A mixture of alcohol, ether, and chloroform was administered, but after about four minutes the respiration suddenly ceased, and efforts at resuscitation were unavailing. The jury were of opinion that the relatives should be previously informed that the patient would be placed under an anæsthetic. It will be remembered that one of the few fatalities with nitrous oxide occurred in a case where there was much obstruction about the floor of the mouth owing to malignant disease, and it is easy to imagine that in such a condition there is much danger of interference with respiration. In the present case it was stated that the patient could not have survived more than two months.

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.—The Annual Calendar of the College has just been published, giving the usual information, and the statistics of the various examinations. As is generally the case the proportion of rejected candidates is highest in the primary examination for the Fellowship; 160 presented themselves, of whom only 62 passed, while 89 were "referred." For the final, 54 passed and 45 failed. The Board of Examiners in Dental Surgery have held two meetings for the examination of 129 candidates, 88 of whom received the diploma, and 41 were referred. The fees paid amounted to £924, the Board receiving £541 16s. It is stated that the number of Licentiates in Dental Surgery is now 927. During the year more than 400 specimens have been added to the Museum by donation, purchase, or from the College stores, and about 1000 volumes represent the year's increase in the Library. Two members of the College have been removed for misconduct.

Abstracts of British & Foreign Journals.

CLOSURE OF THE JAWS FROM INJURY AND ARTHRITIC INFLAMMATION.

By Paul Swain, F.R.C.S. Eng.

A woman twenty-two years of age was admitted into the South Devon Hospital on Sept. 13th, 1892. When nine years of age she had scarlet fever, after which she was unable to open her mouth. In 1880 she was operated upon by Mr. Spanton, and again in the following year. At the time of her admission the jaws were perfectly closed, it being impossible even with the gag to separate them. Two lateral incisors on the left side had been removed to enable her to be fed. The lower jaw had evidently not developed with her growth and was much smaller than it should be. On Sept. 16th she was operated upon as follows. An incision about one inch and a half long was made at the angle of the jaw on the right side, parallel with the line of the jaw, the point of the angle being at the centre of the incision. The knife was carried at once down to the bone. With a raspatory the whole of the periosteum on the outer and inner surface of the angle of the jaw was lifted from the bone, together with the muscular attachments of the masseter and the internal pterygoid. A narrow saw was then applied, and a triangular piece of bone was removed, including the angle of the jaw, and measuring at its base about one inch. There was little hæmorrhage, no vessel requiring ligature. A small drainage-tube was inserted and the wound closed with silk sutures. A similar operation was then performed on the left side, and on its completion the jaw could be opened to its widest extent. The patient suffered from no constitutional disturbance and was able to swallow fluid nutriment the same evening. On the third day the dressings were removed and passive movement was commenced. This was continued daily, the patient suffering little or no pain from the movement. From the time of the operation until now she can open her mouth to the full extent and can masticate very well. There is very slight lateral movement.

I believe, so far as my investigation goes, that there is no other recorded case in which this operation has been performed on both sides at the same time. In the case related by Dr. Maas the right side was first operated on, and four or five months later the left side. In Mr. Bennett's case a week elapsed between the first and second operations.

There are twenty recorded cases of operation for closure of the jaws the result of injury or disease of the temporo-maxillary articulation. Of these, seven resulted from the after-effects of scarlet fever, three from measles and subsequent otorrhœa, three from rheumatism, two from affections of the teeth, and five from injury. The operations performed were excision of the condyle or portion of the neck in eleven cases, Esmarch's operation in five cases, division of ligaments in two cases, simple division of the ramus in one case, and removal of portions of the neck in one case. In nearly all the cases various attempts had been made to remedy the defects by the use of the gag under anæsthetics and by the subsequent insertion of boxwood plugs. This practice was attended with universal failure, to say nothing of great suffering to the patients, loss of teeth, &c. It is to be hoped, therefore, that for the future this futile method will be dismissed as worse than useless.

The division of ligaments by Mr. Spanton's method does not hold out much prospect of permanent success. Mr. Heath tried it in one of his cases, and failed. Nor is simple division of the ramus encouraging. There remain, then, to discuss the two other methods—viz., excision of the condyle, with or without a portion of the neck, or Esmarch's operation for removal of a wedge-shaped portion of the bone. Eleven of the cases were operated on by the former method, so that it may be presumed that hitherto surgeons have given it the preference. As regards the operation itself there can be no doubt that of the two it is by far the most difficult. Anatomical considerations would alone make it so. In one case the external carotid was wounded, and in others a facial paralysis ensued, which, although of only a temporary character, yet sufficiently demonstrates the dangers to the facial nerve. In most of the cases several vessels required ligature, and the recovery was tedious and sometimes attended with considerable constitutional disturbance. The resulting scar, also, on the face, especially in females, must be disfiguring. If, however, the results were vastly superior, there might be a compensation for these drawbacks.

Taking the recorded results as a whole, I am inclined to think that they are not sufficiently good to warrant us in incurring the extra risks and difficulties of the operation. In five of the cases the mouth could only be opened—one one inch, two three-quarters of an inch, one nine-sixteenths of an inch, and one half an inch. In no case is there any voluntary lateral movement reported, with the exception of Mr. Barker's case, so that the grinding power in mastication, which one might have supposed would have been restored by this operation, is not recovered. The danger of subsequent ossification is also demonstrated in Case 16.

I will now compare this procedure with the modification of Esmarch's operation which I have described. From an anatomical point of view there can be no doubt that the operation is a far simpler one. The incision is so placed behind the angle of the jaw as to be hardly perceptible. The careful raising of the periosteum from the bone not only renders the future steps of the operation almost bloodless, but affords great support to the central portion of the jaw, especially when, as in my case, both sides are operated upon simultaneously. The only really important parts divided are the inferior dental artery and nerve. From the artery there is little or no hæmorrhage, and should it occur it is most easily controlled by plugging. The division of the nerve is absolutely of no importance, the only result being slight anæsthesia of the skin over the chin. The division of the bone at the angle sets free the whole of the masticatory apparatus of the lower jaw, which can be at once opened to its full extent. The subperiosteal method preserves the attachment of the superficial portion of the masseter to the angle of the jaw, and also that of the internal pterygoid to its inner surface, thus keeping intact the two elevator muscles. If a sufficiently large wedge of bone is removed the danger of relapse is very remote. Taking, therefore, into consideration the simplicity of the operation as compared with excision of the condyle, and the superiority of the results, I think it may fairly be suggested that the modification of Esmarch's operation is the one which surgeons in the future should prefer.

The Lancet.

THE FIRST PERMANENT MOLAR.

By Dr. R. M. Sanger, East Orange, N. J.

The first permanent molar is the link that connects the temporary with the permanent set of teeth, and it is due to this fact, more than to any idiopathic conditions, that this tooth is more often lost than any other. Primarily the fault is with the parent, who thinks that the second teeth first appear when the child begins "shedding teeth." Until a tooth is lost, it is usually thought that all the teeth in the mouth are temporary in character and will be replaced. The yawning caverns in the first permanent molars are uncared for, because they are "only baby teeth, and will come out anyway," a prophecy which comes true because of the ignorance which made it. But secondarily it is the fault of the dentist that these teeth are so considered, and so lost. The one stigma against our profession today is that we do not practise preventive therapeutics, but are satisfied to repair the ravages of disease. The physician is constantly and studiously seeking for some means of preventing and exterminating the diseases ofmankind, while we at most seek for the etiology of a disease and having settled upon some fixed theory in regard thereto we consider that all is accomplished. We know how the disease is caused, and we know how to deal with it when presented to our notice, and so we await its coming and then treat—and charge for the service. But in relation to the first permanent molar, more than any other, it should be our duty to so manage, at least with those families in our practice over whom we have complete control, that a large cavity, with the sequence of death of the pulp and abscess, should rarely, if ever, occur.

It is a well-known fact that caries is a disease more of youth than of maturity. If an individual at the age of forty presents a set of teeth in which forty fillings have been placed, it would be a safe estimate to judge that thirty of these had been inserted prior to the age of twenty. The cause of this is dual. There is little doubt that where normally good health exists throughout the life of the individual, the teeth are constantly becoming more and more dense in structure, and therefore more resistant to the ravages of decay. Per contra it follows that the younger tooth is more liable to be destroyed. From this it results that during the earlier years there will be more decay present in a given mouth at a stated time, supposing the teeth to be unfilled, than at a later period. This leads us to the consideration of the second and more important cause. It has been shown and freely admitted that caries is a disease of bacterial origin. It must therefore be an infectious and contagious disease. Dentists do not give this sufficient consideration. In the first place, how seldom are the temporary teeth filled! The second molars most frequently, the first molars occasionally, and the anterior teeth scarcely ever. Thus when the first permanent molar is approaching, not only is it in the very condition which renders it most liable to carious attack, both because of its internal structure and its position in the mouth, its deep sulci overlapped with gum-tissue as it slowly emerges, but it actually pushes its crown forth into an area reeking with contagion. It is small wonder that decay rapidly ensues. Then, by the ignorance of the parent and the consequent neglect, small cavities in the sulci grow to monstrous proportions, so that by the time the incisors are in place we have four large garden pots in which myriads of bacteria are thriving. Yet we are astonished and cry, "What a shame;" when at the age of ten or twelve we are compelled to extract these teeth, which have now come to be abscessed, and at the same time we must place approximal fillings in the incisors. But whose is the fault? It is with ourselves. If there is ignorance which causes that disease to thrive and flourish, what is more simple than to so educate those who place themselves in our charge that because of the more intelligent attitude of the patients the disease itself may be aborted? The first step, then, in the care of the first permanent molar is to see the child at or before its eruption. The parents must be taught that the approaching teeth are intended by nature to last a lifetime; that they do not belong to the temporary set, even though no teeth have been lost antecedently, and above all things that they need close scrutiny to preserve them. With the parents thoroughly educated to the importance of the situation, the dentist becomes responsible.

Before all things, all decay must be eradicated from the mouth, even though this necessitates the extraction of some of the temporary teeth. No possible derangement of the regularity of the second set is sufficiently proportionate to the danger which the first permanent molar encounters in the presence of the rotten milk-teeth, to excuse the retention of roots and remains of teeth which cannot be filled. The simple rule then is, in regard to the molars of the temporary set, that they must be filled or extracted. If abscessed, extraction is advisable, even though filling be possible. As to the anterior teeth, many of these may be filled, especially the cuspids ; but where filling does not seem advisable, at least the decay should be removed, and the cavities treated with nitrate of silver or made as smooth and flat as possible. But for the sake of the advancing permanent teeth, the mouth should be rendered absolutely free from all pollution. If this be thoroughly accomplished, the battle is half won, and the first permanent molar will have a new lease of life.

If the mouth is seen at that period when the molars are but half erupted, something can be accomplished by an examination to discover whether or not the sulci are deep, as they probably will be found to be. If so, a bit of spunk pressed tightly under the overhanging gum will in a few minutes elevate the soft tissues, and dry the parts sufficiently to permit the smearing of the coronal surface with oxyphosphate. This if the mouth be kept dry with a napkin for a few minutes, will adhere sufficiently well, especially deep down in the sulci, to serve as a protection during the period of eruption, a time fraught with much danger to the tooth.

Where the teeth are already erupted when seen, possibly at the seventh year, then all the sulci should be probed, and the slightest cavity is an indication that a filling is needed. What shall that filling be ? Fill with gold, if other conditions, such as the temperament of the child and the sensitiveness of the salivary glands, do not contraindicate. In the lower molars the sulci are cut from end to end in both lines of the cross, even though the cavity proper is a tiny pit at one end, and a single filling is made to occupy all of the vulnerable territory decayed or liable to decay. In the upper teeth, usually two fillings are needed in each tooth, the one in the posterior sulcus extending into the palatal groove very frequently. It will not commonly be found difficult to use the dam over the lower teeth, so that there will be no excuse for shirking a thorough filling ; but in the upper jaw it will often be a serious matter to accomplish this. If it can be it should be done ; but if not, a perfect filling of gold may be made, using the napkin to keep the moisture away. The cavities may be superficially large, but they are rarely deep, and by working rapidly with the aid of a saliva ejector, the desired result may be attained. Crystal gold is very useful in these places.

Later on, perhaps at the tenth year, the cavities may be much larger, if indeed they were not very large at the seventh year. If the four teeth are found all with deep cavities, nearly approaching the pulps, and probably very sensitive, leathery decay lining the walls, special treatment is necessary. At the first sitting as much decay should be removed as can be done with safety to the pulp and without too much pain to the child. But at this early age it should be remembered that the pulps are very large, and therefore easily exposed if the decay be ruthlessly scraped away. It is better to be very cautious, and, having gone as far as safety permits, a good germicide should be sealed within the cavity for at least a week. The mere mopping out of a cavity with cotton saturated with an oil or an acid will not accomplish what is needed, which is the sterilization of the decay that is to be left in place for a time. The essential need is to obtain a deep penetration of the decayed dentine by the medicament, so that the bacterial germs, the agents of decay, may be eradicated by extermination. Ordinarily, with adult teeth, all carious matter should be removed, as the only absolute method of aborting decay; but in these young teeth, where the decayed dentine is of that particular kind which we call leathery, it is perfectly justifiable to leave a considerable layer at the bottom of the cavity. Nay, when we consider the troublous sequences of pulp-death, we see that it is absolutely demanded that the effort at conservation should be made. The argument against this procedure is that if we could remove this stratum of leather-like material, and examine it microscopically, we would see that it harbours colonies of bacteria too innumerable to count. That these may continue to exist and exert destructive influences, even though covered by a filling which, tightly placed, excludes light and imprisons them in microscopic confinement, is well known. Therefore it follows that only as dead germs will it be safe to tolerate their presence near a pulp. Professor Miller's experiments as to the penetrating powers of various germicides conclusively proved that at least twenty-four hours is necessary for the best to pass through carious dentine to even a slight depth; it is therefore evident that the germicide shall be sealed within the cavity for at least a week. By that time we have a right to hope that the decayed dentine has been rendered innocuous, and may be left in contact with the healthy dentine to which it is adjacent without danger. Before filling this cavity, it will be as well to coat the walls with one of the balsam preparations, and then covering the floor of the cavity with a thin disk of asbestos saturated with the gum preparation, to prevent irritation of the pulp by the acid of the cement, and from thermal changes.

In choosing how to fill, several methods are open to us. To use a filling of oxyphosphate alone is not bad practice if the child will be continuously under observation, so that renewals may be made as required ; but perhaps it will be preferable to use oxyphosphate mixed with the alloy of one of our amalgam preparations. In a short time after insertion the oxyphosphate washes out slightly, but by attrition the exposed ends of the fillings coming to the surface are ground down, until finally the whole filling presents with a metallic surface, which prevents further disintegration.

Another method is to half fill the cavity with oxyphosphate cement, allowing all the walls to be smeared, and then before it sets amalgam may be inserted. This makes a good permanent filling, easily inserted, and will preserve the tooth certainly for several years. Then, when renewal with gold is indicated, the whole may be removed, and the decay which was left in will be found hard and dry. If desired, it may be scraped out, for by this time the retiring pulp will have protected itself by proliferating a new layer of dentine between itself and the enemy.

It not infrequently occurs that the first permanent molars are brought to us with fully one-half of the crowns lost by decay, so that they present without a vestige of the original coronal contour remaining, appearing merely as badly decayed roots. Yet when we come to examine we find that the pulps are still living, and the typical leathery decay is all that protects them from the outer world. Not even in this condition should these teeth be relegated to the forceps. Rather, even under these deplorable circumstances, make the effort at salvation. The procedure is thus : Take a careful impression with plaster, and upon the model, having the occlusion indicated by a bite, construct a band which is so wide that it would not permit the closure of the mouth. Then carefully crimp in the edges of the band until the occlusion is accommodated. In this manner a sort of skeleton crown is produced, the top being open. This is carried over the remains of the tooth in the mouth, and at once the case is made to resemble the previously described condition. We may now seal in the germicide, covering it with a temporary stopping, and a week later, when the cement is inserted, the coronal band is securely fastened, the dam or napkin having been placed so that dryness is assured, and the upper part is to be filled with amalgam. This, unlike the last, is to be counted a permanent operation.

The Dental Cosmos.

PRUDENCE AND GUTTA-PERCHA IN CROWN AND BRIDGE WORK.

By George V. I. Brown, Duluth, Minn.

Bridge work embodies dangers, increased proportionately to the greater strain it is necessarily called upon to bear and its difficulty of adjustment, with the added risks of the perhaps doubtful capability of a few roots to perform the natural service of several, besides having to support the sometimes not inconceivable weight of the attachment, and must be so formed that the collection of particles of food and other readily decomposed matter between the bridge and the membrane covering the ridge under it may be avoided by making the surface self-cleaning so far as possible.

Crowns inserted with any of the oxychloride or oxyphosphate cements, without band or other protection at the joining with the root, no matter how secure the pin may be, must be considered as of a temporary nature, for no matter how perfectly the surfaces may be adjusted, disintegration will surely follow, and not only cause loosening of the crown, but allow more or less destructive action upon the root itself.

The use of amalgam as a setting is, of course, a great improvement upon cement in crowns of this class, but even amalgam is not always proof against bacterial influences at that critical point, the gingival line, as shown by the frequent failure of fillings. The force of the jaws applied in general use, or an accidental blow, not infrequently causes that most serious of possible troubles, the splitting of the root perhaps beyond repair, unless these crowns are protected with a band, a thing not ordinarily practicable in using amalgam, or by making the end of the root convex, and having a concavity in the crown to fit over it, by grinding slanting surfaces externally and internally from a point in the centre, giving a "V" form, or taking some other precaution to equalize the strain so far as possible, and distribute its effects all around the root instead of being applied to one side without the assistance of the support of the other.

The Logan, Bonwill, Howe, and other *all*-porcelain crowns most commonly used with cement and amalgam, as described, have certainly the advantage to some extent in natural appearance, which must be conceded for the six anterior teeth over other methods which require the use of a plate tooth with backing.

Noting the value of a band for the security of the crown, a special consideration of its application is next demanded.

The perfectly fitting band, as described by the facile pens of writers and the positive statements of discussers of the subject, to the experienced mind, must be much modified to conform to the hard facts of daily practice. Granted that upon a single reasonably sound root, ground down and stripped of its enamel, with the gum in a normal healthy condition, a band can be so fitted that when set with cement there will be but little if any fear of disintegrating action of the secretions ; grant still further that this would also hold good where two such roots were situated in the mouth in suitable position, so nearly straight in the jaw as to admit of the completed piece being passed over each at the same time and in the same direction, then ask ourselves how many of all the broken down and once diseased roots that we desire to save would correspond to that description, and of all the bridge cases we have and are caring for, in how many are the roots so conveniently situated ; add to these the consideration that in all other cases more or less opportunity must be offered for the secretions to act upon the cement, knowing as we do that it offers but very uncertain resistance to such action, and we realize at once this weak point in present methods, and the need of some improvement in this direction.

The teachings of Dr. Flagg and his followers, while, perhaps, going further than could be generally recommended, have at least been instrumental in establishing the value of gutta-percha in its capability to withstand the action of the acids of the mouth, and as a preservative against caries even where every other filling material would fail ; its only disadvantage being that it wears away too readily in exposed positions; but while its good properties are of the first importance in crown-work, the softness does no harm, because it is protected from wear and will not disintegrate. The advantages may be summed up before proceeding to more detailed description under the following heads:—*First.* It is impervious to acid secretions or bacterial influences. *Second.* Not irritating to surrounding tissues. *Third.* Easily removed when necessary. As against these three there is simply one consideration, viz., the difficulty of adjustment. The value of these properties can best be understood by contrasting with other methods generally advocated.

The system once so positively advanced, but in the light of civilized progress apparently losing advocates, which required the snapping off of natural tooth-crowns, the destruction of pulps by driving a wooden point into the living contents of freshly uncovered canals, and the withdrawal of the pulp with the wood, is unprofessional to a degree bordering closely upon the barbaric.

For firmly fixing the position of teeth loosened by pyorrhæa, bands carefully fitted, soldered together, and cemented in place are a step in advance, but they also allow the pressure upon the crowns to work to their disadvantage, and the cement gives out so soon that they can hardly be considered of any paramount value.

Filling with gold about a gold wire embedded in the cutting edges of lower incisors is not only exceedingly laborious, but it is also a difficult and uncertain operation to impact the gold securely when the teeth are not held so firmly that movement is next to impossible; and it is almost an impossibility to do it, because not only are such teeth capable of forward and backward, lateral and circular movement, but upward and downward as well, and thus making a very poor resistance to the necessary force in condensing the gold, without which the operation is valueless.

The anchoring of amalgam upon each side and building across from one to the other, even in most skilful hands, seems to be insufficient, except in very favourable cases, besides being, as already stated, most unsightly. But by dressing the sides of the tooth as straight as possible up and down, grinding enough of the cutting-edge to allow of a covering of gold without interfering with the occlusion and bevelling to let the enamel edge hide, so far as possible, the gold covering a metal die made from a cast and perfect impression, the crown of gold plate struck up and made to accurately fit the cast, and the front part afterwards cut out, these all put in place in the mouth, an impression taken and all soldered together, then set with gutta-percha, the result is that each tooth not only is firmly held in position with its neighbour, but the edges are so covered that no upward and downward movement can occur, and we know that gutta percha, while it may wear off a little at the exposed edges, will not disintegrate under the gold covering, therefore that operation may be regarded as a permanent one, besides being less unsightly than most of the other methods which do not require cutting off the tooth. This method applied to the abutments for bridges where any of the anterior teeth remain in a condition sufficiently sound to warrant preservation of the natural crown, avoids the destruction of nature's handiwork as shown in a living, nourishing, healthful pulp and natural tooth structure gives an attachment that is absolutely secure and proof against every force that may be applied without fear of checking porcelain fronts, can be carried up beyond the gingival margin, left a little short of it, or taken to the enamel line, just as the surrounding conditions seem best to warrant, because of the trustworthiness of gutta-percha under fire of the secretions.

To one accustomed to use cement for this purpose the difficulty of applying gutta percha as a substitute seems almost insurmountable; but a moment's recollection of the trials attendant upon the setting of his first crowns will recall the fact that cement too had its difficulties for the beginner.

For gold crowns where teeth are covered entirely, the author prefers the red gutta-percha we get in the form of sheets. It has a degree of toughness that is valuable, but for anterior crowns with open faces the red line at the edge of the opening is undesirable, and he therefore uses some white preparation that softens at a low temperature, as this property greatly facilitates its handling in the mouth. There being no danger to apprehend from wear, hardness is not so desirable as for filling. Heat both crowns and setting material upon a tray to protect from the open flame, spread with warm instruments a thin coating over the inner surface of the crown, which should be first roughened on the inside by scratching with an instrument, aiming to have as nearly as possible the exact amount necessary, but depending upon a vent to get rid of a small amount of surplus; then after drying the surface of the teeth with alcohol and warm air blast, wipe with some suitable germicide, saturate a pledget of cotton in eucalyptus, coat the surface with it to prevent the too rapid drying of the chloro-percha, of which a thick solution is then applied around the neck, so that when the crowns already heated as hot as they can be handled in the fingers and prepared as described are driven home, the eucalyptus, chloro-percha and gutta percha in the crowns will form a thick creamy mass that will penetrate and perfectly fill every space about the necks, and even if the surplus be not removed afterwards, will not cause irritation as might a particle of cement in the same position.

Sometimes too much gutta-percha will prevent the crown going quite into the proper position, just as sometimes happens with cement; but the remedy is much simpler, because easily removed while still warm; or if, for accidental or other causes, removal be desired afterwards, hot water or hot air applied will in a short time heat the metal sufficiently to soften the material and facilitate the separation without the necessity of damaging the crown, and any one who has tried to pull them off without first warming will be quite satisfied that any properly adjusted crown can be securely held in this manner.

International.

AMALGAM.

By T. W. Prichett, Whitehall, Ill.

Our patient being in readiness, we invite him to a seat in our operating chair—and proceed first to antisepticise our hands with soap and water. With our disinfected mouth glass, we begin our examination to find carious teeth. Here is the first upper molar, with an extensive cavity in the mesial surface and extending upon the occlusal surface beyond the marginal ridge. Looking further we find the second bicuspid decayed upon the occluso-distal surfaces in a similar manner. With chisels and other suitable instruments we will open up the cavities to view, and to facilitate the removal of the decay. The latter being done several considerations are to be borne in mind at this stage of the case, viz., Anchorage for the retention of the fillings, extending the cavity margins with reference to anticipating future decay, the restoration of proximate contact, and the preservation of the interproximate space by a proper shaping of the cavities to conform to these several requirements. Having the cavities prepared, the salient features as to anchorage consisting of a broad cervical base and a pit or step in the central fossa, with or without retentive shape of the side walls, we are ready to fill. The rubber dam will now if not before, be placed in the usual way, and the cavities dried and sterilized. As it is difficult to fill and finish two proximating cavities at one sitting, we will fill the bicuspid cavity temporarily with gutta percha, and to serve also as a brace for the matrix while filling the molar cavity with amalgam. A thin piece of copper has preference for a matrix, because of its flexibility and its adaptability to the necessities of contour and easy removal. It should be long enough to reach around upon the buccal and lingual surfaces about half way. We will place our matrix in position and secure it by packing the proximate space with warmed Gilbert's stopping, extending it around bucco-lingually in sufficient quantity to cover in the ends of the matrix. If a clamp or separator is used, pack plenty of the stopping upon it to hold the matrix more securely.

In all cases, malleting should bring to the surface a visible amount of mercury. We will place a small pellet of the mixture in the cavity, and with a slightly oval, smooth faced instrument adapt it to the cervical wall by direct and rotary pressure ; working it out from the central mass to the side walls of the cavity. This first pellet and all others that come in contact with the walls, should be worked down thin, so that the purer alloy may be forced into the closest possible relation to these surfaces. Other pellets will be added and condensed with hand pressure, using instruments of as large face as the cavity will permit. When about one-fourth full introduce a pad of fine bibulous paper and upon this place the plugger point and begin the malleting. The face of the instrument should be directed towards the buccal and lingual as well as the cervical walls, to insure greater uniform density of the mass. The general shape of the filling at this stage should be concave. The surplus mercury may be wiped away with bibulous pads, and the filling carried to completion with or without the intervening pads, using the mallet to the last.

The cavity should be filled overfull about all the margins, to permit of trimming the filling to proper form, and the removal of the less dense outer surface. We will now remove the stopping, straighten out the ends of the matrix and gently tilt it back and forth until it will detach without injury to the surface of the filling. Trim and shape the filling approximately to the form desired, and make the final finish at a subsequent sitting. When the patient returns the first filling is completed. We wish to maintain the full width of the interproximate space, or perhaps to increase the width slightly, in consequence of closure for want of contact. After replacing the rubber dam, adjust a separator, and press the teeth apart a distance equal to the thickness of the matrix used, plus some allowance for finishing the proximate surface of the filling Adjust the matrix as before, and proceed with the filling as in the molar. In removing the matrix in this instance, it may be facilitated by a turn of the separator screws. Now finish the filling as near to the desired form as possible, and remove the separator. The proximate surfaces of the fillings should come into immediate contact, and with a *free* form for interproximate space the ideal comfort and safety. After hardening, any excess about the margins of the filling may be removed with finishing files and other suitable instruments. The method of procedure here described, may, as a general rule, be applied to occluso-proximate cavities of the bicuspids and molars of both jaws.

All of us have observed that cavities with weak walls, having little or no supporting dentine, are liable to fracture under the force of mastication long before leakage could induce recurrence of decay. This danger may be reduced to the minimum by shortening the weaker wall as in the case of a crown cavity in a molar, extending near to the junction of another surface. Very liberal grinding down may he indulged in, and instead of great strain against a weak, long wall, we will have a short wall as a base to resist the crushing strain exerted upon the filling. The buccal and lingual angles of the cusps when frail, may be cut away and strengthened upon the same principle—adequate anchorage of course to be secured in the most available portions of the tooth, according to the circumstances. Good preparation of cavities is just as essential to success with amalgam as with any other material. The ideal cavity form for amalgam would be box-like, with slight divergence toward the axial wall, for retention. Too much anchorage or *undercut* may be as faulty as too little, tending to leakage and liability to fracture of the walls. Such cavities may sometimes be changed from irregular to simple form, by lining them with cement, and finishing with alloy.

We will now consider some of the situations when and where amalgam may be used with propriety. First, and broadly stated, in any and all the teeth, temporary and permanent wherever you do not *wish* to use anything else. Second, in any and all cases where you *cannot* use anything else. Third, in bicuspids and molars, more frequently than in incisors and cuspids.

The first and second classification refers in the main, to teeth of inferior organisation, large and irregular cavities, anything involving doubt of reasonable permanency, if any other material be used. This will include the filling of the incisor teeth of young persons *tentatively* with amalgam, if by so doing the form of the interproximate space would be better maintained—the fuller development of the process following as a necessary sequence. Subsequently when more favourable conditions supervene, such fillings may be removed and replaced with gold with greatly increased expectancy.

The third classification is a field less limited in choice of materials—bicuspids and molars, than any other, and it is here that amalgam has shown its highest capability for good. It is here also that its greatest failures have occurred—as when all reasonable conditions are absent, neither it nor any other material will save teeth for a great length of time.

The old controversy as to whether amalgam shrinks or expands in hardening, has not, I believe, been authoritatively settled. However this may be, it is patent to every one's observation, that leaky margins more frequently occur in fillings of amalgam than of any other.

Having referred to some of the objectionable qualities of amalgam, it will not be unfair to say something of its good qualities. It is sufficiently hard to resist wear against the most vigorous mastication. It possesses "preëminent" working qualities, in most situations, being remarkably cohesive. It is easily condensed, and its wide range of adaptability to all forms of cavities is not surpassed by any of the metals now in use.

Nearly every practitioner must have need of some intermediate material that will enable him to meet a great variety of conditions and wants of his patients—not the least of which is their purse. Many persons who need and ask for our services cannot reward us for gold fillings, so we must have something as a compromise with which to extend useful service to the largest number. What else will serve this purpose so well as amalgam?

The Dental Review.

ADAMANTINE EPITHELIOMA OF PARADENTAL ORIGIN.

By MM. Nove-Josserand and Berard.

Under the title of epithelioma adamantine MM. Nové-Josserand and Bérard describe a form of solid tumour of the jaw which arises in connection with a retained tooth. This tumour runs a remarkably slow and painless course, and histologically its elements resemble the proliferating epithelium of dentigorous cysts.

The origin of nearly all cysts of the jaw from paradental epithelium is well recognised, but solid tumours, on the other hand, are usually supposed to be sarcomatous. The adamantine epitheliomata are surrounded by a definite wall of sclerosed bone, and can be completely removed by scraping the bony cavity, moreover, they do not show any tendency to recur after removal.

The following cases are quoted as examples of the disease :—

Case 1.—A woman, æt. 29, who had suffered from dental pain for 5 years. Three and a-half years before, a swelling developed in the body of the lower jaw near the left angle. This was painless for a year, but soon the teeth became painful, the worst of which seemed to be the second left lower molar ; this was extracted, but found to be perfectly sound. She had relief for a few months but the pain returned, and several abscesses formed in the cheek as high up as the zygoma ; these left fistulæ with an offensive discharge which induced the patient to apply for relief. On admission there was a swelling the size of half a mandarin orange occupying the left side of the lower jaw from the first molar tooth as far as the ascending ramus. The wisdom tooth was absent, and over its site was a fungating mass of granulations the size of a nut. There was no fluctuation over the swelling nor eggshell crackling : on probing the fistulæ soft tissue was felt inside the bone. The situation of the tumour at the angle of the jaw, the absence of the wisdom tooth, the slowness of the evolution of the malady, and the persistence of increase of the swelling after avulsion of the second molar tooth (which made room for the wisdom tooth) induced M. Ollier to diagnose the case as a tumour of dental origin in connection with the missing wisdom tooth. The outer shell of bone was removed in order to explore the interior of the bone which was found to be filled with soft friable tissue of a sarcomatous consistence. This was scraped away with a sharp spoon, and a search was made for the wisdom tooth without result. The cavity was then filled with iodoform gauze and rapidly filled up. A month later the wound was healed with the exception of a small granulating mass, on probing which a tooth was felt. This was removed and was found to be normal in shape, it probably was the missing wisdom tooth. The patient had no further trouble. Microscopic examination of fragments of the tumour showed a mucous, and embryonic type of connective tissue embedded in which were masses of cells of an embryonic epithelial type together with others of the so-called adamantine type, which resembled those seen in the proliferation of the internal walls of a dentigerous cyst. Three former cases of M. Ollier so far resemble this one that they are considered as examples of this condition, although a microscopic examination was made in one case only.

Case 2.—A boy, æt. 13, had a slowly growing tumour of the superior maxilla with absence of first molar tooth; there was eggshell crackling over the swelling. M. Ollier operated by the mouth, and after removing the osseous wall he found a solid tumour with a central cavity the size of an almond; he scraped this thoroughly away and discovered the missing tooth in the substance of the superior maxilla. There was no recurrence eleven years later.

Case 3.—A child, æt. 10, with a tumour beneath the orbit and absence of the canine tooth of the same side. On operating, a cavity in the superior maxillary was found, which was filled with a soft wine-coloured mass without any cysts. Several rudiments of teeth were seen in the new growth which was scraped away. There was no recurrence of the tumour, but the patient returned 15 years later with a series of small teeth (the size of rat's teeth) along the cicatrix which had to be removed.

Case 4.—A woman, æt. 36, who had a tumour at the angle of the lower jaw for four years. There was in addition a discharging sinus. The bony wall was removed, and a cavity filled with solid growth was found, but no included tooth was seen. The cavity was plugged with gauze and healed readily. Microscopic examination of the fragments showed fibrous masses between which there were columns of adamantine epithelium.

These tumours clinically resemble cysts, both on account of their slow and painless progress, and of their association with the absence of a tooth. It is only during the operation that an accurate diagnosis can be made, and then of course the question of sarcoma will present itself. In these tumours the tissue, although soft, is less friable than in sarcoma, and moreover, the tumour is limited by a bony wall not infiltrated by the neoplasm. The diagnosis will be complete if a more or less formed tooth is found in, or in the neighbourhood of the tumour.

The authors consider that these tumours are as benign as cysts, and do not require the same free operation which a sarcoma does ; for this reason it is important to diagnose between them and sarcomata, since all the four cases cited were cured by simple scraping.

The Medical Press.

THE QUALITIES OF A TYPICAL DENTIFRICE.

By Arthur Turner, L.D.S., Edin.

By a typical dentifrice we mean one adapted to general use, in contradistinction to powders having special qualities prescribed for use in special cases. In building up our powder we have first to look for a mechanical base which shall be capable of cleansing the surface of the tooth, without the possibility of doing any chemical or mechanical damage to its structure.

On comparing the claims of the official chalks, we much prefer the " preparata " to the " precipitata," for every particle of the former has been suspended in water by virtue of its own lightness, whereas every crystal of the " precipitata " has been thrown down from a condition of semi-suspension in a solution denser than water by means of its own still greater density. It may be contended that the precipitated form is not entirely or exclusively crystalline, but it will be admitted that it is composed largely of crystals. The mention of crystalline calcic carbonate makes us think of it in its native form—white marble; and who would think of cleaning a delicate structure with a powder having physical properties in any degree like those of marble? Having satisfied ourselves, by means of the official test, that the prepared chalk does not contain silica, we have a base as nearly perfect as possible. The presence of myriads of germs in the saliva is easily proven, and there is danger that lingering traces of either solid or liquid food may become, even in the healthy mouth, both septic in influence and acid in reaction. We do well to counteract these tendencies by giving our base an increased anti-acidity, and also by making it antiseptic, for it is obviously necessary for the well-being of the dental tissues that the fluids of the mouth should be kept alkaline and aseptic. A small proportion of such an ant-acid as bicarbonate of soda gives the necessary extra alkalinity. Only a small proportion is required, because healthy saliva is itself alkaline and our mechanical base is also slightly so.

For the antiseptic property we plead strongly for the use of oil of cinnamon. It is free from the objectionable qualities of the harsher antiseptics, such as carbolic acid or eucalyptus oil, as found in most samples in British commerce. Experiments prove cinnamon to be an efficient germ-killer. We do not think its antiseptic powers are sufficiently valued. Moreover, used in proper proportion, it is pleasant to the mouth and imparts a most delightful sensation of cleanliness and sweetness. Should the typical dentifrice contain an astringent? We think not. Most astringents are unpleasant, and consequently should be omitted, if only for the sake of the children who will be expected to use it. As to colour, we see no objection to whiteness. If this be unpopular, let us be careful to use only harmless and neutral tinting ingredients.

We welcome the fashion of putting up the dentifrice in wide-mouthed bottles with sprinklers, and condemn any method of putting up where there is a temptation to dip the wet brush into the powder. We advise putting the *fullest directions* on the label. These should include the rinsing of the mouth with water after the use of the powder and advice as to the use of a soft brush. Warm water is indispensable in winter, especially for children. If the powder be only used once a day, bed-time is better than morning—but both are to be preferred.

Dental News.

CHARING CROSS HOSPITAL, MEDICAL SCHOOL.

The Scholarship of 60 guineas open to students of the Universities of Oxford and Cambridge, has been awarded to Mr. William Cecil Bosanquet of New College, Oxford.

The entrance Scholarship of 120 guineas has been awarded to Mr. A. K. Taylor, and that of 60 guineas to Mr. Ernest Lewis Lilley.

A TRURO DENTIST AND HIS APPRENTICE.

At a special sitting of the Truro County Court, before his Honour Judge Granger, William Richards Tuck, dentist, Truro, sued Thomas Powell, of Idless, Kenwyn, farmer, and George Herbert Powell, Truro, manufacturer of artificial teeth for £50 damages for breach of covenants contained in an indenture of apprenticeship, dated 29th January, 1890, and made between the above named defendants and the plaintiff.

Mr. Nalder said—In this action I appear for the plaintiff, who for many years has carried on business as a dentist in this town. The defendant has been for some years, until 1894 an apprentice of his, and the action is brought to recover from the defendants, George Herbert Powell and his father, monies which the plaintiff alleges were received by the defendant during his apprenticeship in respect of work done by him during that time, and which we say, having been done by him in his capacity as the plaintiff's apprentice, he had no right to do. This would have been an enquiry of a somewhat painful nature, and I am pleased to say at the last moment I have come to an agreement with my friend Mr. Dobell that there shall be a verdict for the plaintiff for £10 and costs, which will satisfy the principle for which the plaintiff contends and will, I hope, save a good deal of unpleasantness and annoyance.

Mr. Dobell—I have investigated the matter on behalf of the defendant, and I find there were certain sums of money about which there was considerable doubt as to whether the defendant ought to have received them. Your Honour has had before you the apprenticeship indenture and it says he has to work within certain hours. He did work outside those hours, and he made a charge for work he did on his own account, and the question is whether that work should go to his master. I have carefully considered the matter, and in advising my client to consent to this order, I think that justice will be done to both parties. As I understand, all imputations of every kind and description are withdrawn by both parties.

The Judge—I think the defendant has been very well advised in taking the course he has taken on the recommendation of Mr. Dobell; and having said so much, I need say no more. The verdict will be for £10 and costs.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
6. The Journal will be supplied direct from the office on PREPAYMENT of subscription as under:

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British Journal of Dental Science.

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GENERAL PATHOLOGY AND SURGERY FOR DENTISTS.

By Edmund W. Roughton, M.D., B.S., (Lond.), F.R.C.S. (Eng.)

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(*Continued from page* 923.)

TUMOURS.

The term "tumour" in its widest sense denotes a swelling, no matter what the cause or nature of it may be: thus an abscess, a gumma, a caseous mass, an effusion of blood, a distended bladder, a displaced bone, are all tumours in this sense. When speaking pathologically, it is customary to limit the term tumour to designate only those swellings which are the result of abnormal growth of tissue and which have no tendency to undergo spontaneous cure or to dwindle under the influence of drugs.

The elements of which a tumour is composed resemble those found in the healthy tissues either in their fully developed condition or in their immature stage of development. Tumours are supposed to arise by the multiplication of preexisting cells, and to retain the type of the cells from which they sprang. Very little is known of the causes which give rise to the growth of tumours; they not unfrequently follow upon prolonged irritation, chronic inflammation, or injury, but the exact relation of these conditions to tumour formation is not fully understood. In former years, tumours, especially cancer, were supposed to be hereditary, but now, the idea has been almost entirely given up and a local cause is favoured. During the last few years some pathologists have endeavoured to prove that many tumours, especially the more malignant varieties are the result of the action of a microscopic animal parasite to which the name *psorosperm* has been given. This view is not at present generally accepted.

Clinical Course. The clinical characters which different kinds of tumours present have led to their being divided into *Innocent* and *Malignant.* Innocent tumours grow slowly; they resemble in structure fully formed tissues such as fat, cartilage, bone, etc., and usually are composed of the same kind of cells as the tissue in which they occur (*homologous*). They are enclosed, as a rule, in a fibrous capsule, they are well defined and circumscribed, and simply push neighbouring parts on one side without infiltrating them. They do not involve the lymphatic glands, they do not become disseminated in distant organs, and they do not grow again after they have been completely removed. An innocent tumour may nevertheless cause death by pressing upon some vital organ. Malignant tumours grow rapidly; they do not resemble the tissue in which they grow (*heterologous*), being usually composed of immature cells like those of the embryo; they tend to infiltrate neighbouring structures rather than to push them aside; they often lead to secondary deposits in the neighbouring lymphatic glands, and become disseminated throughout the body by means of the blood or lymph stream. They often recur after removal, either in the scar, the lymphatic glands, or the internal organs. They cause death by exhaustion due to pain, hæmorrhage, general interference with nutrition from the rapid growth of the tumour and its dissemination throughout the body, or by direct interference with a vital part.

Classification. Tumours may be classified in different ways; it is most convenient to classify them according to their structure, thus :—

TUMOURS.

A. CONNECTIVE TISSUE TUMOURS.

- I. Those composed of fully-formed connective tissue. (They are clinically innocent.)
  1. Fibroma.
  2. Lipoma.
  3. Enchondroma.
  4. Osteoma.
  5. Myxoma.
  6. Myoma.
  7. Neuroma.
  8. Angeioma.
  9. Lymphangioma.
  10. Lymphoma.
- II. Those composed of embryonic connective tissue. (They are clinically malignant.)
  - Sarcoma.

B. EPITHELIAL TUMOURS.

- I. Those composed of fully formed epithelial tissue. (They are clinically innocent.)
  1. Papilloma.
  2. Adenoma.
- II. Those composed of embryonic epithelial tissue. (They are clinically malignant.)
  - *Carcinoma.*
    1. Squamous-celled.
    2. Spheroidal-celled.
    3. Cylindrical-celled.

FIBROMA.

Fibromata are composed of fibrous tissue ; some of them are hard, and are composed of dense bundles of fibres closely interwoven (see Fig. 10), others are soft, and are composed of looser fibres containing a number of cells and spaces.

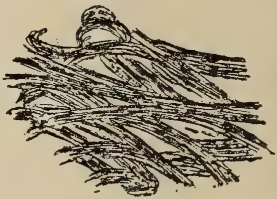

Fig. 10.—FIBROMA.

The soft fibromata grow from the subcutaneous connective tissue and form pedunculated tumours ; the hard fibromata grow from the periosteum of bones, especially the jaws. They grow slowly, and are painless, unless they happen to involve a nerve ; they are globular, smooth, and, as a rule, freely moveable. They should be removed by operation when practicable. They do not recur.

LIPOMA.

Lipomata are composed of fat (see Fig. 11) ; they occur

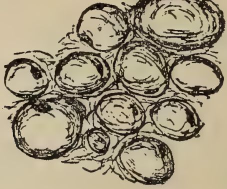

Fig. 11.—LIPOMA.

in two forms—the circumscribed and the diffuse ; the former being quite common, and the latter decidedly rare.

The circumscribed lipomata are enclosed in a fibrous capsule which is usually adherent to the skin and but loosely attached to the tumour. They grow slowly, are lobulated, freely moveable on the deeper parts, but cause a dimpling of the skin when the latter is pinched up over them. They are most often seen in the subcutaneous fat in the region of the shoulder and buttock.

The diffuse lipomata are not surrounded by a capsule, but are directly continuous with the fat in which they grow. They are usually found at the back of the neck and under the chin in stout middle-aged men.

The circumscribed variety should be removed; they shell out of their capsules readily. The diffuse variety is best left alone.

ENCHONDROMA.

Enchondromata are composed of cartilage. They are innocent tumours, and grow slowly; cartilage is, however, sometimes found in malignant tumours (chondrifying sarcoma). They are composed of cartilage, the matrix of which may be either hyaline or fibrous (see Fig. 12), they are usually encapsuled and lobulated. They may undergo calcification or ossification, or they may soften, forming cysts. They are most commonly found growing from the phalanges of the fingers, but are sometimes also found in the parotid

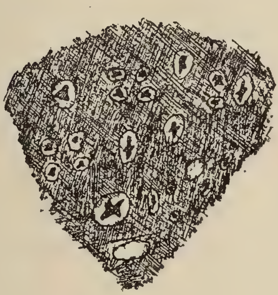

Fig. 12.—ENCHONDROMA.

gland and testis. They should be removed when possible; the pure enchondroma does not recur after removal.

OSTEOMA.

Osteomata are composed of bone. They will be dealt with under *Diseases of Bone.*

MYXOMA.

Myxomata are composed of tissue resembling the Whartonian jelly of the umbilical cord; they are really soft fibrous tumours in which nearly all the intercellular substance has become replaced by mucin in which the branched connective tissue corpuscles are suspended, forming a kind of loose network. (See Fig. 13.) Myxomata form soft semi-translucent gelatinous tumours, often pedunculated, and yielding a tenacious glairy fluid on section. Their commonest situation is the mucous membrane of the nose, where they constitute the ordinary nasal polypus. They should be removed; they do not recur.

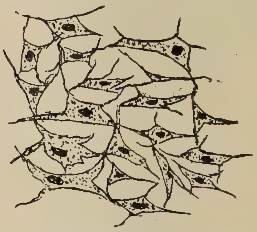

Fig. 13.—MYXOMA.

MYOMA.

Myomata are composed of muscle tissue, nearly always of the unstriped variety. They are most commonly seen in the uterus and prostate gland. They are composed of long spindle-shaped nucleated cells held together by a reticulum of fibrous tissue. They are prone to undergo calcareous degeneration, especially when situated in the uterus. They are innocent tumours, and do not recur after removal. Their common situation renders them only occasionally amenable to surgical treatment.

Tumours containing striped muscle are very rare, are usually composed chiefly of sarcoma tissue, and have been most often found in the kidney.

NEUROMA.

Neuromata are tumours situated on nerve trunks. Pure neuromata are very rare; they are composed of medullated or non-medullated nerve fibres. False neuromata are composed of fibrous, myxomatous or sarcomatous tissue.

ANGEIOMA.

Angeiomata are composed of blood vessels. They occur in two chief forms, the *capillary*, and the *venous*. Capillary angeiomata (*nœvi*), are composed of a fibrous stroma containing many large thin walled capillary vessels with frequent irregular pouches and anastomoses. They occur in the skin, forming the so-called "port wine stains," "mother's marks," etc. The venous nœvus or cavernous angeioma consists of large cavernous spaces lined with endothelium. They are usually formed in the subcutaneous connective tissue, forming soft swellings which can be emptied by pressure. Nœvi are always congenital. They may be treated by

(1) Excision with the knife.
(2) Ligature.
(3) Coagulating injections.
(4) Electrolysis.

LYMPHANGIOMA.

Lymphangiomata are tumours composed of dilated lymphatic vessels.

LYMPHOMA.

Lymphomata are tumours composed of lymphatic gland tissue. Except for their large size they closely resemble normal lymphatic glands, both in naked eye appearance and in their microscopical characters.

(*To be continued*).

VULCANITE WORK.

By Harry Rose, L.D.S. Eng.,
Lecturer on Dental Mechanics, National Dental College.

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(*Concluded from page* 931).

Method for Producing the Fac-simile of an Old Case.

Case in Practice.—Here the patient had become so used to the position of the teeth on her old cases, that it was found necessary, in order to give her satisfaction, to copy her old upper piece to arrive at the result required. An impression of the patient's upper jaw was first taken and a plaster cast obtained. The old upper case was then placed on the model and fixed there with a little hard wax. Facets were then cut in the front of the model to serve as guides. Some soft A 1 composition was then taken and moulded so that it covered the surfaces of the six front teeth and extended downwards into the marks, or facets, on the front of the model. When hard, this piece of composition was removed, and bevelled to a feather edge at the distal extremities of the canines. It was then replaced on the model and dusted with French chalk ; more composition was then moulded over the faces and crowns of the bicuspids and molars, as well as into the facets at the sides of the model, and of course extending some little distance on to the front section. This plan was carried out on both sides. When quite hard, these pieces as well as the old case, were removed from the model, the surface of which, as well as the composition, was then lubricated, the former with soap and the latter with vaseline. They were then replaced, omitting the old piece, of which the composition represented an impression, and were fixed firmly with hard wax. Some plaster of Paris was then mixed, and poured into the composition impressions as well as on to the surface of the alveolar ridge of the model, and allowed to thoroughly harden. When quite hard, the sections of composition were removed one at a time, and then a slight tap on the bottom of the model was sufficient to loosen the plaster piece. This, when trimmed up, gives us a sufficiently accurate duplicate of the old piece in plaster.

The same course must be adopted if it is found necessary to copy the lower case.

It is usually necessary to proceed in the manner I have described, in the case of those patients who have worn the same case for a number of years, and have become habituated to "the feel," and also to the expression it gives to the features, and who at the same time are not willing to leave the old cases with you for any length of time. Such a case I had to undertake a short time since, and although I mounted the teeth so as to give her a more pleasing expression (fortunately trying the case in the mouth with wax), yet the friend who accompanied her thought, and it naturally biassed the patient, that the old case looked more natural than the new. The patient was so deaf that I could not get her to understand that she must not bite so hard, and she destroyed the appearance of my waxed-up case. Seeing how the matter stood, I told her that as she seemed so used to the position of the teeth on the old case, it would be best for me to mount the new teeth in a similar manner, which I did after the method I have attempted to describe, the results in this case being equally satisfactory to both the patient and myself.

METHOD OF REMODELLING A CASE ON WHICH ARE MOUNTED GUM BLOCKS.

When removing these from Vulcanite for the purpose of remounting them, it often happens, no matter how careful one is, that a block will crack, or some other mischief occur To avoid this, I have latterly been treating the case as one block, and have so cut and trimmed away the vulcanite from around the gum blocks, by filing or with a sculptor, that it may afford plenty of strength and room for the new rubber.

There is some difficulty in packing rubber round this in the ordinary way owing to the absence of spaces between the teeth. So in order to overcome that, it is as well to do it in the following manner.

First dry the model and paint the gum with a solution of chloro-rubber, then take a thin sheet of rubber, soften it and mould to the surface of gum. The reduced piece, with the blocks on, is now placed in position, and built up to the bite with additions of rubber beneath, if found necessary, and then the pink rubber, or red, (if pink is not required) is packed around the front of the case, and the back or lingual aspect of the case moulded up with wax in the ordinary way. We shall thus have a case ready for the flask having its buccal and labial aspects packed and only leaving the lingual part to be packed after the removal of the wax in the usual manner.

This is a very satisfactory method for remodelling a case such as I have described. Care must of course be taken that the blocks are made to approximate properly with their opponents in the opposite jaw, and at the same time the new rubber should cover and quite conceal all portions of the old.

The Insertion of Swivels in Vulcanite Dentures, for the Attachment of Springs.

For convenience of description we will divide the Swivel into its various parts, under the names of Head and Bolt (Fig. 15), Eye and Shaft (Fig. 16), and the Washer (Fig. 18). Fig. 17 represents the complete Swivel.

In ordinary cases where there is sufficient room for the insertion of the bolt, it is only necessary to reduce its length by a third.

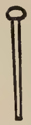
Fig. 15.

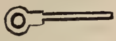
Fig. 16.

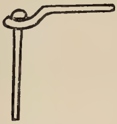
Fig. 17.

Fig. 18.

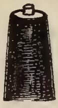
Fig. 19.

The washer is made by punching a hole through a thin piece of gold or dental alloy, and trimming it round to correspond to the eye of the swivel, or a round disc with a hole in it can be cut out at once by a suitable punch (Fig. 19) placing the thin metal on a piece of lead while so doing.

The washer is for the swivel eye to work smoothly against, and to prevent the friction which would result if the swivel rested against the vulcanite.

After slipping it on the bolt it is pressed tightly against the swivel eye and kept in its place by nicking the bolt with a sharp sculptor, the bolt may then be roughened or flattened at the end in order to retain it firmly in the vulcanite.

After the case has been waxed up (see Fig. 5) a hole is made in the wax with an old broach or piece of wire made warm. The place for this is between the second bicuspid and first molar, and these teeth may, if found necessary, be cut away at their necks in order to afford sufficient space for the bolt between them.

The swivel bolt is now slightly warmed and pressed into the hole so made, taking care that the shaft of the swivel works perfectly parallel and just allows sufficient space for the thickness of the gold spring between it and the teeth.

This precaution is very important, inasmuch, as if the spring does not work properly, it either rubs against the teeth, or perhaps, what is still worse, cuts into the cheek. To a total disregard of this important fact is frequently due the dislike with which springs are regarded by many.

When there is a very small amount of room, as in a case of a somewhat prominent alveolar ridge, and the artificial gum has to be very thin in front of it, it may be found necessary to fix the swivels in a different manner, that is by reducing the bolt until it is $\frac{1}{8}$ of an inch, and after drilling a hole in a piece of plate $\frac{1}{4}$ inch square, rivetting the swivel to it and then soldering. This piece of plate takes the place of the washer previously described, and should be hollowed out with a file at the sides so that it presents four projecting points. These points are bent backwards so as to form a clamp. (see Fig. 20).

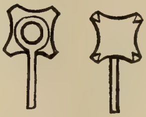

Fig. 20.

This may now be pressed into the wax in the proper position, and will then hold the swivel securely in the vulcanite.

The advantage of this form of fastening is that the swivel can be placed high up or low down on the alveolar border, and yet not come in contact with the plaster model.

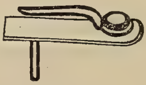

Fig. 21,

In cases, again, where a swivel has to be placed between a natural tooth and an artificial, as, for instance, in a lower case, where the second bicuspids are in position, the standard to which the swivel is attached should be made in a different manner. Take a strip of No. 7 gold or dental alloy plate about half an inch long, $\frac{1}{6}$ wide. To one end of this strip see Fig. 21) the swivel should be rivetted and soldered, and to the other end a piece of pivotting wire should be soldered; this, the fastening, is to hold the swivel firmly in the vulcanite and it can be passed between the first and second molars, or where there is sufficient rubber to hold it.

Other devices for mounting swivels are useful where one has, say, a first molar in position, the spring having to work outside it.

In such a case the swivel may be soldered to a band encircling the tooth with a stop formed by a piece of wire soldered to it to prevent the shaft of the swivel from dropping too low down, and so allowing the spring to cut into the substance of the cheek. Another method consists in having a swivel with an extra long shaft, which allows the head of the swivel to be in its proper position, and yet after describing a half circle round the front of tooth, the shaft may be bent again so as to become parallel. (See Fig. 22.)

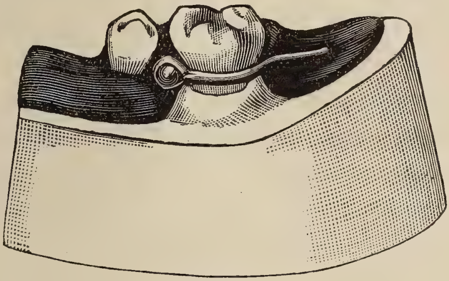

Fig. 22.

To the straight part of this long arm, or shaft, as it is called, the spring may be attached, and the same precaution must also be taken to prevent it from throwing the spring out of place.

Before soldering swivels either to a washer, or to a plate for retaining them in the vulcanite, a little moistened whitening must be introduced between the eye of the swivel and the plate to which it is to be soldered ; this should be done effectually, otherwise the swivel will be soldered up and rendered useless.

The use of springs is indicated in those edentulous cases where one has a patient who cannot tolerate an upper plate extending backwards on the palate, or where one has considerable absorption of the alveolar ridge in the lower. Another instance occurs where one has a projecting bite, or the mucous membrane is of a hard, dry, thin character, or one has reasonable grounds for suspecting that the patient will, either through nervousness or other reason, not persevere in overcoming the habit of the tongue to move the lower case about. Again they must not be dispensed with without due investigation in cases when the patient has been accustomed to their use for many years.

In fact, where any of these considerations are likely to crop up it is just as well to mount swivels on the case, and if they are not required, the patient can, after a short period of probation, have them removed.

I have already said that the usual position for the swivels is between the second bicuspid and the first molar. If a line be drawn across the case from one swivel to the other it will be found that the set is very fairly divided into two halves, and the spring, will thus balance the cases fairly.

The swivels should be so adjusted that a nice even bow or curve can be given to the springs. These latter should be kept as long as the patient can wear with comfort; it is better to use them as weak as possible since they do not tire the mouth so much.

The springs as well as the swivel, are usually obtained from the dental depots and numbered from No. 6 to No. 10 or 12, the strength increasing as the number rises. No. 7 and 8 are those mostly used. To prepare them for attachment to the set, the ends of each should be smoothed with a fine file.

The springs are attached to three of the swivels by screwing them the reverse way, viz., to the left.

The shaft of the fourth swivel must be reduced if too large, so that the springs can be pressed tightly on it, without screwing. It is convenient and saves time if one makes a habit of utilising either the right or left lower swivel to press the last end of the spring on to.

By knowing which end this is, one can remove them with facility. To remove it take a half round sculptor and force it off the shaft. To remove the others take a firm hold of the spring between the thumb and finger, close up to the swivel and unscrew to the left, the same as screwing them on only the spring must be pulled at the same time.

DEVICES FOR STRENGTHENING THE CASE AND TEETH WHERE ONE HAS A VERY SHALLOW BITE.

1st example, where the lower front teeth bite close on the upper alveolar ridge. For such a case a small plate either of gold or dental alloy may be swaged, to which the teeth are to be soldered.

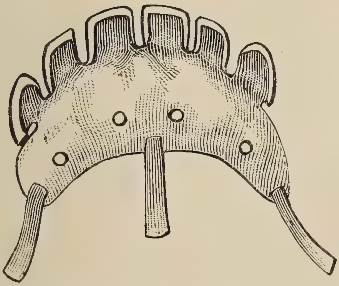

Fig. 23.

The plate should have holes drilled in it and be chamfered on its superior palatal aspect, or have loops or strips of plate soldered to its inferior palatal aspect to secure it in the vulcanite (see Fig 23). It is then placed on the model and the case is waxed up in the ordinary manner.

The same arrangement only on a smaller scale can be used for one tooth by soldering a back and tongue piece, to go into the vulcanite (see Fig. 24).

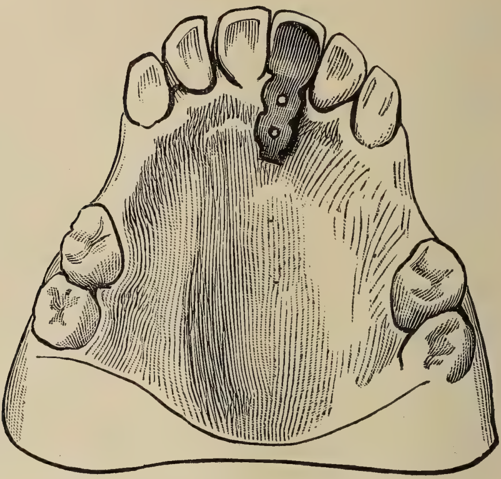

Fig. 24.

2nd example. For strengthening the tooth in the lower where it has to be filled into a narrow space between two teeth, the following plan will be found useful. First fit and back the tooth then solder to the back two pieces of gold wire (Fig. 25), these can be bent at right angles when waxing up the case.

In taking impressions for repairs, the case to be repaired should always be in the mouth and be withdrawn with the impression. By that means the plate assumes its proper position in relation to the part to be added.

When the addition of one or two teeth is contemplated, the impression may be taken by first drying the case, then fixing to it some softened composition, say a little more than will be required to fill up the vacant space.

While still soft, insert the case in the mouth, and having lubricated the tips of the fingers with a little vaseline, mould the composition into place ; now direct the patient to bite into it, and keep the teeth closed until the composition is hard. By these means a reliable model and bite can be taken at the same time, into which a little plaster is run, and a bite prepared.

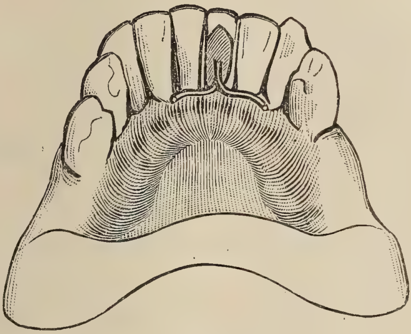

Fig. 25.

In adding a tooth to a thin vulcanite case the following plan may be adopted.

Take an impression as before mentioned, into which cast plaster. Now adapt tooth to model and back it with a piece of gold or dental alloy. Next fit a saddle or tongue of metal extending from the back of the tooth to a strong part of the work.

If the case is thick enough it may be let into it a little so as to make the edge of the metal flush with the plate ; if not, it must fit on the surface. Now drill three holes in the tongue of metal (see Figs. 26, 27, 28) next place the piece of plate in position. Mark the two first holes in the vulcanite, and drill through the case. Two soft silver pins should now be soldered into the plate, corresponding to the holes drilled in the vulcanite.

These having been found to fit satisfactorily, the remaining hole is now marked and drilled in the case, and another silver pin soldered into the remaining hole in the tongue of metal.

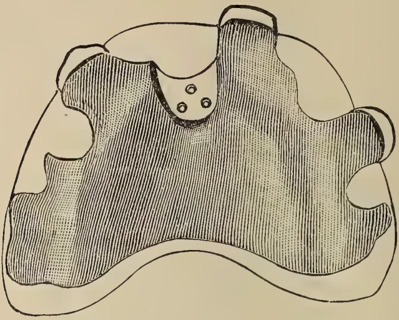

Fig. 26.

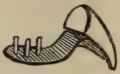

Fig. 27.

The silver wires should be left sufficiently long, so as to form a head when being rivetted.

The tongue of metal is placed in position on the vulcanite plate, and the added tooth cemented to it with hard wax. The tooth and plate are now removed from off the case and invested in brickdust and plaster, then dried, heated up and soldered.

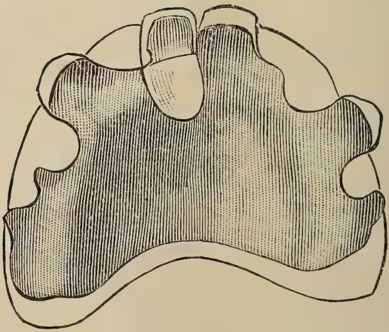

Fig. 28.

When cool it is placed in sulphuric acid to clean, then filed up and polished, when it will be ready to be finally rivetted to the vulcanite plate. The holes in the vulcanite plate should be chamfered on the superior palatal aspect in order to get a good head to the rivets.

The operation of rivetting is best accomplished by placing a broad-ended punch in the vice, and resting the plate on the end while using the hammer.

When the plate is made secure to case it is finally finished and polished in the usual manner.

Another way of giving a tooth to a vulcanite case, when time is an object and when the thickness of the case will permit it, is to cut out the rubber at the back of the tooth to be added in such a manner that it forms a dovetail.

The pins of the tooth are then bent in a suitable manner, and if they are not long enough they can be made so by soldering thin pieces of dental alloy wire to them.

Tho tooth is then made hot, and melted fusible metal is poured or pressed into the recess cut out of the rubber. This holds the tooth firmly in its place, and the whole operation may be accomplished in half an hour. To hold the tooth in place while pouring in the metal a small plaster mould may be used.

DEATH UNDER COCAINE.—The *Revista Estomatologica* of Madrid states that a death under cocaine recently occurred in a dentist's consulting room in Madrid. The patient was a military officer named Vendrell, who was about to have a tooth extracted. The dose used is said to have been large, but no further details are given.

PLASTER IMPRESSIONS AND SPECIAL TRAYS.*

By Mr. WILLIAM JONES.

Mr. President and Gentlemen,—I intend to mention briefly the points which I believe to be the principal pros and cons of the subject, and only hope that you will be sufficiently interested to point out my chief omissions or mistakes.

As advantages attending the use of plaster as a material for taking impressions of the mouth I would submit,—First, a more delicate impression; secondly, soft parts are not pressed away; thirdly, undercuts are correctly reproduced; fourthly, freedom from dragging.

Against the use of plaster we have,—First, its expansion on setting; secondly, the necessity of having a special tray; thirdly, greater difficulties in its manipulation; and fourthly, more discomfort to the patient than is occasioned by the use of composition.

Now to discuss these several points more in detail. The greater delicacy of the impression is I think generally admitted, although, perhaps, it may be claimed that "A1" composition is but slightly inferior in this respect. That it does not press away soft parts makes it very valuable in certain cases of spongy gums, principally in edentulous cases.

With regard to the reproduction of undercuts I have seen very good results obtained by the following method. A special tray is so constructed as to admit of an even thickness of plaster in every part of the impression, the plaster being everywhere of such a thickness as to allow of broken edges being easily and accurately fitted together. Before filling the plaster into the tray the latter receives a thin coat of glycerine. The impression is then taken, and as soon as the plaster is set sufficiently to break with a clean fracture, the tray is removed and the plaster over the buccal and labial surfaces of the gum broken away in large pieces with the thumb and finger until the palatal portion can be removed entire. The pieces, collected in a serviette, are taken to the workroom where they are replaced in the tray, cemented in position and the impression is poured. In consequence of its freedom from dragging plaster is sometimes of great service for taking impressions for pivot work and in some cases of cleft palate. On the other hand we have,—Its expansion on setting; this, which is undeniable, is however but slight. In the well-known experiment of splitting an oil flask by means of this property of plaster, the bulk of plaster used is very great and the displacement of the pieces of the flask is but slight.

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* Read before the Students' Society, National Dental Hospital.

Although a special tray is not an absolute necessity in every case, as in some edentulous cases a stock tray may be used, it has several distinct advantages. A smaller quantity of plaster is sufficient, and the operator is better able to guage the amount required ; again, where the layer of plaster is even the distortion produced by the expansion of the plaster must be much less than where it is uneven.

With regard to the making of the special tray, I am of the opinion that the method of pouring molten metal into a plaster mould is more expedient than that of striking up sheet zinc, which is I believe, in more general use.

Thinking that possibly some gentlemen might not be intimate with the method of pouring trays, I have brought a few examples of the different stages of the process, which will I think speak for themselves.

A wax tray is made to the rough model, a sheet of wax having first been pressed all over the model to allow room for the thickness of the plaster, the wax tray is then invested in plaster, just as you would invest a case in the vulcanizer flask;

lastly, the wax is removed from the mould and the metal is poured in.

The only difficulty I have found in the process is that the metal is liable to spit on pouring, and that it is difficult to get the tray perfectly run although it is nearly always perfect enough for practical purposes. I have tried letting the mould stand over night to dry, but found no improvement; my best results have been obtained by pouring as soon as possible.

I might also mention that there is no necessity to scald the wax out of the mould, as the heat generated by the setting of the plaster makes it so soft that is can easily be pulled away.

The tray I hand round was poured with an alloy of equal parts of tin and lead.

A tray for a partial lower case must be allowed to touch the points of some of the teeth that are standing; if this is neglected the tray may be pressed down until it touches the gum. I have here a specimen that may help to elucidate my meaning. A tray for a edentulous lower case should have the handle built up to clear the lip; though small, these points are very important.

The two remaining objections to the use of plaster namely, greater difficulties in its manipulation and more discomfort to the patient than is occasioned by the use of composition, may be taken together as the secret of mitigating them both lies in getting as nearly as possible the right quantity of plaster and in inserting the tray when the plaster is of the right consistency.

The mode of insertion is well expressed by Mr. Coles, he says:—

"Place it well back in the mouth before you let it touch the teeth; after this bring the free borders of the back part of the tray into contact with the superior part of the palate, and then press upwards and from behind forwards until the whole of the tray embraces the dental arch. Adopting this plan recures two points; you prevent the plaster falling backwards and falling on the base of the tongue to produce retching, and also bring the overplus to the front of the mouth, where it is visible, and therefore more manageable."

The plaster is of the right consistency for inserting when the tray can be turned over without spilling any of it.

It is generally necessary to mix the plaster with warm water and to add a little salt so as to reduce as much as possible the time it must remain in the mouth, generally this is about two minutes.

For lubricating the impression previous to pouring it, I have found soap solution efficient, though many arguments are brought forward in favour of varnishing the surface of the impression with shellac varnish and then oiling.

A word about parting the model and impression. Mr. Cole advises that they be immersed in boiling water for a few minutes as the heat will cause expansion of the plaster and the impression having set first this expansion will be unequal, and so the separation will start of itself.

Gentlemen, my best thanks are due to you all for the patience with which you have listened to me; if this humble effort of mine is instrumental in raising an instructive discussion, I shall indeed be gratified.

TRICHLORACETIC ACID. — This acid is strongly recommended by Dr. Pierce for removing tartar from the teeth. It may be used in place of scaling to remove the last traces of deposit. A wooden spatula is saturated with the acid and rubbed over the deposit, which it at once dissolves. It may also, with advantage, be used to replace carbolic acid as an antiseptic. It is also a powerful escharotic.

British Journal of Dental Science.

LONDON, NOVEMBER 1st, 1894.

EXAMINATIONS.

We have been reading in *L'Odontologie* a witty account of an examination of surgeon-dentists (*session extraordinaire*); and a very extraordinary session it would have been if it ever took place. It purports to give the questions of the examiner, the candidate's replies and discussions between the two, for the benefit of future candidates. The candidate is made to commit dreadful mistakes, and then to shelter himself behind the published statement of a learned authority who prefers the designation of "Stomatologist" rather than that of Dentist. Fortunately matters have not actually come to this pass, and such discussions would be considered a waste of time and an exhibition of bad taste. And yet how many of our latter-day students would prefer their final examination to be conducted upon the old-fashioned method of preparing and reading a thesis before the Board of Examiners? The candidate then supported his statements, met criticisms, and argued in favour of his own views upon *the subject he had himself selected.* Now, when entering the lists he must be prepared to write upon topics selected for him, and no after-discussion is allowed. *Viva voce* examination has become an art for both parties concerned, and it is the custom, amongst the candidates at least, to go in for a course of training under the care of a "coach." It is necessary to have not only a knowledge of the facts of the subject but also the capacity to utilize these to the best advantage. To accomplish this, practice in writing them down in proper form for assimilation by the examiners, and in framing the words in a spoken answer, stands the candidate in good stead. Clumsiness in literary composition and the inability to grasp the meaning of the *viva voce* question and to clearly reply without undue delay, afford one explanation of the occasional failure of a "good man" to sustain his reputation for being "well up." Mere book-answers are not in favour and the confidence of even a well-read student when he finds himself confronted with a good test-question is beneficially enhanced by the knowledge that he can present the answer in an unexceptional dress.

It seems to us that practice in answering questions, written or spoken, will become still more in demand if the examination system progresses along existing lines. It is of course possible, though not probable, that there may be some alteration so far as the theoretical portion is concerned, and that the personal equation element may be reduced to a minimum. Thus, in regard to the selecting of questions, we might imagine a stock of routine subjects stored in a kind of lottery box from which one would be drawn haphazard as required. Even then the interpretation of the answer must perforce be left to the examiners. As matters stand at present there can be no need for any suggestions for new departures in the relations between examiners and candidates. We may confidently believe that the present race of examiners are absolutely fair in their endeavours to sift the bad candidates from the good, and that they are actuated by the sole desire to conscientiously fulfil the functions of an arduous, responsible, and therefore honourable position.

The question of State Examining Boards has been receiving attention at a meeting of the Southern Dental Association in America. It seems a matter for regret that there is no prospect at present of a uniform system of examination, not by many States, but by the United States conferring a Diploma that should be universally recognized. As Dr. BARRETT well put it: when there is a Board that will command the respect of the whole profession, there will be no further trouble.

A TOOTH-ACHE STOPS A TRAIN.—Toothache has been responsible for a good many eccentric actions and, as we know from the old quotation, is not compatible with philosophic calm. And now we read of a French artisan pulling the alarm-bell as a train was leaving a wayside station. Upon the guard enquiring for a cause, the passenger "coolly" replied that he wanted something to cure a raging tooth. Whether he expected the station-master had the necessary remedy does not appear, but in our opinion too much reliance must not be placed upon the sufferer's apparent coolness. The tale ought to finish by a statement that the guard invited his charge to accompany him to his van and that there, from an excellent assortment of forceps, selected one which stopped the toothache as effectually as the bell stopped the train. Unfortunately there was a less fiction-like termination. The guard, who doubtless had never suffered himself, owing to periodical inspection and conservative treatment, had the passenger summoned, and in default of his appearance, a fine of 50 francs was inflicted.

THE TOOTH-BRUSH QUESTION.—The Sheffield Board of Guardians have had a discussion upon the value of the use of a tooth-brush. The Committee of the Children's Homes recommended that a gross of these popular implements should be purchased. A Mr. Chambers, however, thought this was going too far, and found a supporter in Mr. Clark who had never had a tooth-brush when he was a boy. Mr. Chambers, not to be outdone, said he had never bought one in his life. Mr. Ashberry considered it right to teach children to brush their teeth. "Nothing was more painful than toothache, and if the habit of cleansing the teeth were early taught to the children it would avoid many visits to the dentist." The opposition also gave Mr. Newsholme an opportunity to deliver a little hygienic lecture which went somewhat further. He pointed out that if proper attention were paid to children's teeth there would be not only less toothache, but probably also fewer other diseases. Only the proposer and the seconder voted for an amendment to the recommendation, and as the purchase of the tooth-brushes was agreed to, no further opposition was offered to a supply of tooth-paste.

A Survival.—In Vienna an old man named Karl Edelmoser, the proprietor of a shaving saloon and well-known throughout the whole district also as a tooth operator, has had to appear before a criminal court to answer a charge of malpraxis. The indictment urged that Edelmoser had for many years been in the habit of extracting teeth on a very extensive scale. The fee appears to have been 30 Kreuzers. Edelmoser explained to the judge that he felt justified in extracting teeth as he possessed a surgical diploma which he then produced. The judge explained that the yellow document had been obsolete for some time in consequence of later legislation, and the defendant must have been well aware of this. The operator further urged that he had been in the employ of a certificated dentist for 23 years and thus attained great skill, but the judge held this did not qualify him to practise dentistry. The complaint of the police district dentist laid against the defendant was that he had extracted a decayed tooth with a dirty instrument for a cook, and this resulted in periostitis. The judge ordered Edelmoser to pay a fine of 15 gulden (30 shillings) or in default 3 days imprisonment, and the same sum as compensation to the patient.

The National Dental Hospital.—The Annual Dinner of the past and present students has been fixed for the 30th inst. It will be held at the Holborn Restaurant, and Sir Walter Foster, M.P., M.D., has kindly consented to take the chair and distribute the prizes for the past year.

DENTISTRY IN JAPAN.—We have had an opportunity of looking through a dental catalogue printed in Japanese characters and published by Messrs. Ash and Sons. We cannot say we derived much solid benefit from the study of this curiosity, but for any of our readers who are thinking of studying the language it should form an interesting lesson book!

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.—The first meeting of the new session takes place on Monday the 5th inst., and will form a new departure. It will be a "conversational meeting" after the completion of the ordinary business, and should prove very interesting. Mr. Tomes, Mr. G. G. Campion and Mr. Hopewell Smith will exhibit microscopic sections; Mr. Humby will show a method of irrigating impression trays; Mr. G. Brunton contributes a new quick setting amalgam; Mr. Storer Bennett brings two interesting skulls, and Mr. J. F. Colyer some models of Irregularities. It is proposed that the members of the Society shall dine together some time next May, the exact date being not yet fixed.

THE PREVENTION OF TUBERCULOSIS.—Dr. Cooper-Pattin, the medical officer of health for Norwich, read a paper at the Budapest Congress in which he stated that nearly half of the deaths at ages between fifteen and thirty-five years are due to some form of tuberculosis. He urges that these diseases should be brought into the schedule of those compulsorily reported under the Infectious Diseases' Notification Act. He also calls for a regular inspection of all cattle, and particularly dairy cattle, by skilled veterinary inspectors who should be empowered to act effectively where necessary. Another suggestion is that school-children should be instructed in the broad elementary principles of hygiene as part of the system of national education. Dealing with the question as to whether public opinion is ripe for notification the author proposes that the notification should not be considered valid unless the bacillus tuberculosis is demonstrated in some secretion, excretion, or discharge.

Abstracts of British & Foreign Journals.

DENTAL CARIES AMONGST THE FREIBURG SCHOOL CHILDREN.

By Dr. Röse.

The authorised examination of teeth in the Freiburg National Schools has produced an almost alarming result. Amongst the boys 98.5 per cent. have carious teeth, and amongst the girls even 99 per cent. Out of 27,319 milk teeth, 51.3 p.c. of boys', and 54 p.c. of girls' were carious. Of 53,717 permanent teeth 25.8 p.c. of boys', and 27 p.c. of girls' were diseased. Of the whole 81,036 teeth, 28,342 were diseased. It is estimated that of these 21,729 could still be saved by filling, but 6613 were either already lost or required extraction. Out of the whole number only 53, namely 17 milk and 36 permanent teeth, were filled. Under such circumstances, organised attention to the mouth is out of the question. The use of a tooth-brush seems altogether unknown to most of the school children. The conditions of the higher schools, especially in the gymnasiums, are distinctly more favourable than in the common or national schools. In the gymnasium schools there are also 97.9 p.c. of scholars affected with carious teeth, and 25 p.c. of all permanent teeth are decayed. These scholars are, on the average, much older than those of the National Schools. Comparing those of the same age in the gymnasium with the boys in the National Schools, the difference in favour of the former is from 5 to 10 p.c. For instance, at 14 years of age out of the whole of the permanent teeth in the National School 32.7 p.c. are diseased ; in the gymnasium only 22.3 p.c. As a matter of course, a better arranged attention to the mouth is met with in the gymnasium, and it consequently proves that by proper care, not only can teeth already diseased be saved by filling, but that caries itself may be prevented.

In the gymnasium, however, the average amount of care for mouth and teeth is still far from the ideal. Out of 628 examined, 615 had diseased teeth to the number of 4,428. Of that number only 727 teeth amongst 170 scholars were filled, *i.e.*, about one sixth.

In the High School, the Higher Girls' School, and the

Girls' Citizen School, at Adelhaüsen, the care of the mouth and teeth was not so good as in the Gymnasium. In the first place a better state of things was to be expected in the higher Girls' School, as it is well-known that young ladies form a very marked proportion of the dentists' clientele. An examination of the Freiburg Polytechnic School shows the surprising fact that the pupils of from 14 to 18 years of age possess better average teeth than do those of from 7 to 14 years in the National School. This circumstance can only be explained by the fact that many young people from abroad with good teeth were admitted to Freiburg. Indeed a careful inquiry showed that nearly all the pupils with good teeth came from outside, and from districts with calciferous soil. Mr. Schott, the head master, thereupon directed the attention of the authority to the fact that in Furtwangen and the neighbourhood there were just as bad teeth as in Freiburg; against this, the inhabitants of the neighbouring calciferous mountains of Wurtemburg had the most splendid dentures. In consequence of many suggestions he received, the author then endeavoured to ascertain whether the nature of the soil could possibly exercise an influence upon the condition of the teeth. As is known, the formation of the Black Forest around Freiburg consists of gneis free from lime. In this district all the springs have a very soft water almost free from lime. Leguminous plants and other lime-loving vegetation do not thrive on the Urgesteine soil. On the slopes of the Black Forest near the level of the Rhine may be found, on the other hand, calciferous Trias and Jura rock with calciferous springs. In like manner the springs of "Kaiserstuhl" and the water of the Rhine are calciferous. With the help of Lubberger, the chief engineer, it was possible to discover in the environs of Freiburg a number of places which since the memory of man, have always drawn their water supply from brooks or main springs out of the same rocks. Next, many places in the Black Forest free from calciferous water, resembling the Freiburg supply were examined. It turned out that in Gunterthal, Herden, and Oberried, the teeth of the school children were just as bad as in Freiburg. In Waldkirch they were still worse. There it was found that out of 520 school children only four had complete sets of healthy teeth. Above all, the teeth more or less of those mentioned above had a disagreeable blue-grey colour. The state of affairs changed suddenly when the examination began in the places with calciferous soil and water. In Wolffenweiler and Ebringen there was instead of from ¾ to 2 per cent., 8 per cent.; in Uffhausen, 12 p. c.; in Thringen, quite 29 p. c. (155 out of 530) of children with perfectly healthy, faultless sets of teeth. Out of the whole of the milk teeth in Wolffenweiler and Ebringen 40·4 p. c., in Uffhausen 34 p. c., in Thringen 21 p. c. (Freiburg 51·3 to 54 p. c.) were diseased. Of the permanent teeth in Wolffenweiler and Ebringen 10·2 p. c., in Uffhausen 12 p. c., in Thringen only 5 p. c. (Freiburg 25·8 to 27 p. c.) were unsound. Throughout the calciferous regions that beautiful yellowish tooth colour prevails which is so characteristic of well-formed, hard teeth. If one considers, for example, that Güntersthal is situated only about three kilometers from Uffhausen, has the same rural population and yet with regard to the teeth presents such extraordinary differences (Guntersthal 2 p. c. of children with sound teeth, Uffhausen 12 p. c.) it is obvious that, as difference of race is out of the question, the perpetual taking of non-calciferous water, and deficient lime supply through many generations, favours the development of that blue-grey colour, and the production of teeth less capable of resistance, which so easily and quickly succumb to the attack of caries.

Vierteljahrschrift für Zahnheilkunde.

FINGERS AND NAILS IN SURGICAL OPERATIONS.

By Oscar H. Allis, M.D., Philadelphia.

The surgical care of the nails has had its full share of attention. The nail-brush forms a part of every physician's and surgeon's outfit. It is cheap, compact, and moderately thorough. Its disadvantages are that if stiff it is apt to scratch the hand or cut beneath the nails; if soft, it is of little value. To supplement the defects of the brush, some persist in using the point of the nail blade in their pocket-knives. I say persist in using—as much has been written against the practice. Not only is there danger of cutting the flesh beneath the nail, but it leaves the under surface of the nail rough, making it a ready collector of filth, and less easily cleaned for a subsequent operation.

To avoid the knife I have long used a little wedge-shaped piece of soft pine. This, when wet, frays up, makes a kind of mop, is a good carrier of soap, and enables me to wash out under the nail. The objection to my device was that the pine too rapidly frayed out, became bulky, and required frequent trimming. Finally I hit upon the rubber eraser. A variety is made for artists and school children that is wedge shaped. This is ready for use as it is found at the stationer's, though if made a little sharper it is softer and more like a mop. It is pliable, soft, and an excellent carrier of soap.

For the hand, generally the old-fashioned wash-rag cannot be improved upon. It is a good carrier of soap, and with it each finger in turn can be tightly caught and wrung until it is clean. With the nail or hand-brush only the back and front of the fingers get the scrubbing.

In addition to the implements usually deemed important for the cleanliness of the under surface of the nails, a very valuable one is the nail itself. Noticing that a young lady's fingers whom I frequently met were exceedingly neat, I made bold to ask her method, and was surprised to find that she had nothing more modern than a pair of scissors to trim her nails, and that with the wash-rag and the tips of her finger-nails she kept her hands in most perfect order. One thing that may be said of the finger nail as a nail-cleaning instrument is that it will not scratch the under surface of the nail, a very important factor in the process, whether one aims at beauty or cleanliness.

Medical and Surgical Reporter.

IMMEDIATE ROOT TREATMENT.

By Edmund Noyes, D.D.S., Chicago.

We find a few teeth with dead pulps that are so free from decay as to make it certain that the pulp chambers have never been opened. We do not always feel called upon to disturb them, but frequently we do. In a majority of them sepsis is plainly enough evident, and they must be treated accordingly. Some of them appear to be aseptic, but are not really so, and the proportion in which we may be so sure of it as to fill immediately, is rather small.

The immediate filling of teeth with abscesses having fistulous openings relates to the disinfection of the pulp chamber and canals, as in all other cases involving sepsis, and to the convenience of using the root canals as channels for the conveyance of force or pressure for the evacuation of the abscess cavities, or the introduction of medicines.

There are many teeth in which the foramina are so small as to be useless for these purposes, and they may as well be closed as soon as disinfected, but there are many others in which the root canal and the fistula furnish openings at both ends of the abscess cavity and make it possible to give them much more thorough and successful treatment than would be the case if the canals were closed. This is so much so that a very large proportion of them will get well after one thorough treatment, and many operators feel so sure of that as to fill them at once, but some of them will not get well after one treatment, and it is just as easy to find out whether they will, before we fill them as afterward.

Immediate root filling is theoretically possible, and even entirely practicable if circumstances require it, in a very much larger number of cases than those in which it is clinically expedient. Many careful or cautious operators, who can control their patients, will practise it very seldom indeed. Others, more bold, or whose practice may make it more necessary, will do so very often, but all should draw the line, strictly, at those teeth having the entire pulp canals in a septic condition.

Disinfection of teeth is usually considered to relate only, or at least chiefly, to the pulp chambers and canals. Occasional appearances seem to indicate instances in which the dentine itself (the tubuli contents) has become so foul as to require that disinfection reach through its substance. It is usually supposed, I believe, that the tubuli of normal dentine are too small to admit of septic germs, but they certainly do sometimes admit freely the products of decomposition, as is evident by the great change of colour. Of course if the dentine is to be disinfected, the time required is likely to be greater than is necessary to disinfect the chamber and canals. Some work lately done by Dr. Black, which I trust we shall hear about in due time, seems to indicate that a very considerable amount of organic matter can readily be dried out of an extracted tooth and replaced by water. That diffusibility and displacement are practicable to some extent between the foul contents of dentinal tubuli and fluids or medicines that can be placed in the pulp chamber, is evident from what we often accomplish in the bleaching of teeth. Whether, with the tooth in the mouth, the tubuli contents can be removed to any great extent by drying may be doubtful. There is little doubt that the dentine will readily absorb something else to take the place of whatever portion of the tubuli contents *can* be dried out of them. Clinically it is evident that in most cases we need not give ourselves very much concern about the tubuli contents beyond what is accomplished by the disinfectants used with direct reference to the pulp chamber and canals. Of course such medicines must not be coagulants, or we cannot expect them to accomplish *anything* in the disinfection of dentine.

The Dental Review.

GUM LANCING IN DIFFICULT PRIMARY DENTITION.

By Dr. E. C. Kirk, D.D.S.

Nearly all medical writers agree that the teething period is one fraught with danger. Statistics show that the percentage of infant mortality is markedly higher during teething. A long series of infantile disorders occur most frequently during that period, and while recognizing this coincidence we find many otherwise intelligent practitioners ignoring the possibility of a causal relationship between these diseases of infancy and the teething process, and consequently, condemning the operation of gum lancing, not only as useless, but dangerous.

I have been unable so far to find any reported case of fatal result from gum lancing, nor have I knowledge of any untoward result occasioned by it when correctly performed. It is quite true that no precise scientific demonstration by the microscope or by post-mortem examination has been made to settle the question of the exact rationale of the procedure pro or con. The conditions are such that it perhaps never can be made, but this same objection might be as potently urged against many other well-established therapeutic measures in constant legitimate use.

The value of gum lancing in difficult dentition is established almost solely on clinical evidence, though it is difficult to understand why the perfectly plausible hypothesis of the rationale of its action should be rejected by its opponents as imperfect, when that set up by them in rebuttal is so manifestly illogical and inconsistent. Clinical evidence depends for its value upon the character and relationships of the phenomena observed, and the frequency with which certain related phenomena repeat themselves under similar conditions. If, for instance, infantile convulsions occurring coincidently with difficult or delayed eruption of the teeth are found to be relieved by a judicious use of the gum lancet, and a favourable result is obtained invariably in a number of cases so treated, we should be justified in assuming the causal relation between difficult dentition and infantile convulsions within certain limits, and be justified in the use of the lancet as a therapeutic measure for their relief. This relationship has been repeatedly observed. I have in several instances seen teething children, where convulsive seizures had supervened until the child was almost comatose, relieved at once and veritably snatched from the jaws of death by freely dividing the gum over the retarded teeth.

But convulsive seizures are not the only pathological results of delayed dentition. The irritation caused by the advancing tooth is but slight at first, and extends over a considerable period of time. The impress upon the nervous system of the child may be comparatively slight, so that its expression may not be manifested in the explosive outbursts of the nervous system which we know as convulsions. The nervous stress is more commonly manifested in loss of appetite, impairment of the digestive function and nausea. Impairment of the digestive function, due to interference with the innervation of the stomach, whereby the food invested becomes itself a source of irritation through the establishment of fermentative processes throughout its mass, leads to and is accountable for the train of intestinal disorders, infantile diarrhœas, intestinal catarrhs, etc., which so often accompany the teething process, and constitute the *bete noir* of mothers in rearing their children through the much dreaded second summer. Where the digestive sequelæ of pathological dentition have established themselves, the lancet cannot be expected to effect a cure unaided. Its use should be followed by appropriate constitutional treatment.

The close relationship of difficult dentition and capillary bronchitis in infants has frequetnly been noted by medical writers and practitioners, but the idea of pathological dentition as a predisposing, not tc say exciting, cause seems to have been overlooked until recently, notwithstanding the fact that in very many of the fatal cases of croupous pneumonia in young children there has been a definite history of difficult dentition immediately antecedent to the pulmonary attack. Recent observations lead me to suspect that in these cases the antecedent condition of difficult or pathological dentition has been the cause which induced the subsequent attack of capillary bronchitis.

In this connection it may be well to call to your attention the investigations recently published by Dr. Emil Schreier, of Vienna, with respect to the nature of the infecting organism in apical pericementitis. This observer found in all the cases of apical inflammation about the roots of the teeth which he examined, twenty or more in all, the diplococcus pneumoniæ, invariably present as the exciter of the inflammatory process. This is in line with Miller's investigations, which showed that the diplococcus pneumoniæ was a constant inhabitant of the mouth. As a further link in this particular chain of evidence, Dr. C. N. Peirce recently recounted to me two cases of incipient croupous pneumonia which occurred at different times in a family who were patients of his. In each instance the child was suffering from difficult eruption of the teeth, and in each case croupous pneumonia was set up as a sequel. In both cases Dr. Pierce performed gum lancing, and in both cases there was subsidence of all the distressing symptoms in a few hours, with rapid and complete recovery. To any one who has investigated this subject, especially from the clinical standpoint, there can be no doubt as to the great utility of the operation in relieving in many cases the most alarming symptoms. It is simply and easily performed, and there are no weighty objections which can be used against it, so that it is a matter of continued wonder that there can be found in the ranks of medical practitioners those who still strongly oppose it.

It may be asked of what interest can the question be to the dentist, who is seldom if ever called upon to operate in these cases. To this I would answer, prepare yourselves by an intelligent understanding of the operation, and its correct relationships, and you will be consulted with respect to these matters when it is known that you are competent to give judgment upon them. Or if the knowledge has no usefulness outside your immediate family, it may still afford you the opportunity to save the life of someone dear to you, as I verily believe it has on more than one occasion in my own family circle.

The Dental Practitioner.

LOWER MOLAR ABSCESS.

By Roderick Maclaren, M.D.,
Senior Surgeon to the Cumberland Infirmary.

I purpose in the following remarks to call attention to a condition little recognized and ill understood, namely, a special form of abscess which results from dead molar teeth. I have seen it perhaps a score of times. It has always been a serious condition, often a dangerous one, and in three instances, it has been fatal. In one of these cases death was from blood poisoning, in another there was impending suffocation and death occurred during anæsthesia, and in the third the pus burrowed down the neck, and a rapidly fatal pneumonia occurred. I have only seen it in connection with second lower molars and wisdom teeth. The usual story is a tooth or teeth badly decayed, often only the putrid stump left. Then an inflammatory attack, perhaps rigors, much constitutional disturbance, and temperatures taking high ranges. Locally there is closure of the jaw, considerable swelling of the sides of the neck and face, often dysphagia, and sometimes dyspnœa; the swelling is diffuse, involving the cheek, the parotid, and submaxillary regions; it often extends considerably down the neck, and is sometimes most prominent under the chin, at other times at the angle of the jaw. It feels hard and brawny, and no fluctuation can be detected in it. It may be impossible to say which side is most swollen. Some years ago I saw, in consultation with my friend Dr. Hair, the first of the above mentioned fatal cases. A young solicitor's clerk aged 23, had one fang of a lower second molar extracted about a fortnight before he came under Dr. Hair's care. The removal of the other was attempted, unsuccessfully, as we found out at the post-mortem examination. The swelling of the tissues prevented us from seeing it during life. Shortly after this, inflammation started in the socket. Then the patient shivered, his temperature rose, and his face and neck became swollen, red, and brawny. Pus was let out by incisions in the mouth. The shivering recurred, putrid infarces gave rise to numerous abscesses of the face and head. These were incised, and fresh endeavours were made to drain the original abscess, but in spite of this he got worse. The eyelids swelled, symptoms of sinus thrombosis supervened, and he died. No doubt infection of a fatal kind had occurred before he came under medical treatment. Leave was obtained to make a *post mortem* examination, and the following condition was found. The fang of the second molar was loose in its socket: it was surrounded by pus. The neck of the fang was tightly embraced by the gum, which prevented the escape of matter. As a consequence, pus had welled over the inner alveolar edge; it then separated the periosteum, and burrowed along the internal pterygoid, and among the muscles and cellular tissue on the inside of the lower jaw. The reason why it took this course was the simple mechanical one that the inner alveolus was lower than the outer, and the discharge flowed over the first edge which it encountered. The position of the collection of pus among the muscular planes round the hyoid bone accounted for the swelling being so diffuse and so prominent under the jaw. The pus was horribly putrid, just as might be expected from the exciting cause being a decayed fang.

I have constantly had the opportunity of observing in other cases that the above is the usual mechanism of the condition. The pus fills the socket; it is stopped by the gum embracing the neck of the tooth or fang; it drops over the lowest edge of the bone, separates the periosteum and then burrows. When the abscess is opened, a surface on the inside of the lower jaw, just at the angle, is found bare to the extent of about a square inch, and this sometimes dies and separates, as in the case of a child of 4, who was in the Cumberland Infirmary last July. The second lower temporary molars, in a state of decay, had been extracted a few days previously on account of swelling and pain on both sides of the lower jaw; pus was escaping freely from both sockets; the child was very ill. A probe was passed down inside the jaw to each angle, and two incisions were made from the outside. The child improved rapidly, and was presently sent out with two discharging sinuses. She was readmitted at the end of October. A considerable portion of the left angle of the jaw had separated and was removed.

Dr. Finley, (House Surgeon, Cumberland Infirmary) has kindly, at my request, gone over a number of lower jaws in the Museum of the Royal College of Surgeons, with the object of ascertaining the relative heights of the inner and outer alveolus of the second lower molar; 227 jaws were examined ; of these 86 had the inner alveolus lower than the outer, 78 the outer lower than the inner, and in 63 they seemed equal in height. This is apparently the reason why abscess is sometimes on the inner side of the jaw, sometimes on the outer. The latter is a comparatively trivial ailment.

Under the somewhat fantastic name of angina Ludovici (Dr. Ludwig, of Stuttgart) a condition is described which closely corresponds in clinical characters to the subject of this paper. But it has not been distinctly associated, so far as I can ascertain, with an origin from decayed lower molars. Now, though I cannot of course assert that it is always due to this cause, it certainly has been my individual experience to have encountered it only in this connection. Sometimes the source was not stated by the patient ; complaint was not always made of tooth trouble, but always when the condition was investigated, the decayed tooth with suppurating socket was found.

The treatment should be prompt and as thorough as it can be made. The tooth fang or fangs should be extracted at once then a free incision should be made from without on the angle of the jaw. If wished, a probe can be used as a guide ; it can generally be passed down beside the socket, made to enter the abscess cavity, and then be felt just below the angle. As a rule, however, I cut without such a guide, just feeling for the angle of the bone, and cutting directly on it. Finally the cavity should be well washed out and drained. If this be done before constitutional infection to any great degree has occurred, improvement is rapid and satisfactory.

British Medical Journal.

THE EXTENT OF RECUPERATION IN DENTAL TISSUES.

By Dr. W. E, Burkhart, Tacoma.

1. Enamel has no recuperative power, and all loss of tissue must be restored artificially.

Whatever our theory of caries in detail, we know that all destructive agents proceed from the external surface of the tooth. The enamel is the hardest of all animal tissues, evidently evolved as an armour to protect the less defensive tissues within. Originally highly organic, it is so heavily loaded by the deposition of the inorganic elements that it has no ability to recover from injury, being entirely composed of inorganic elements so far as nervous impressions are concerned, and therefore lacking the first principle of recovery,

2. Dentine has no recuperative power so far as the restoration of lost tissue is concerned, but does possess such from a defensive point of view, and softened tissue may recalcify.

Dentine is very hard and ivory-like, but less dense than enamel, the interstices of the tubuli being filled with a material somewhat resembling protoplasm, which, in the absence of nerves, must be regarded as conveying impressions to the pulp, since dentine, not sensitive on exposure in excavating, becomes so if the cavity be left open a few days. In dentine diseased, but still possessing a considerable degree of vitality, there is often recovery following the insertion of a filling, through the defensive action of the pulp, though missing portions of the dentine are not restored.

3. Pulps have recuperative power ; but,

4. The tendency of all pulps is toward extermination.

The pulp is one of the most highly organized tissues in the whole economy, and within whose realm reaction is most decided and prompt. Immediately following irritation to this organ it makes a call for more blood, which produces inflammation ; the blood-vessels become engorged, causing odontalgia by pressure against the confining walls. This condition usually recovers very well apparently, under anodynes and sedatives, the permanency of the result depending upon the length of time the disease has run and the individual recuperative power of the patient. Why, then, do dentists as a rule finally give up pulp-capping generally, only performing the operation in exceptionably favorable cases?

The tendency of pulps is toward extermination, as is shown by their course of development; first all pulp, then gradually as calcification proceeds growing smaller, until at maturity they occupy a comparatively limited portion, with apparently no other function than assisting in recuperation in case of disease or accident. This, however, is of sufficient value to warrant their saving whenever that can be done.

5. The peridental membrane and contiguous tissue have remarkably strong recuperative power.

Inflamed and ulcerating surfaces of these tissues subside rapidly after the removal of the irritant, many times without further treatment. The writer believes, however, that the explanation of the apparent revival of vitality, and sometimes of sensation, in the peridental membrane in implanted teeth is explainable in the same way as the action of the sponge-graft—it forms a matrix for the deposit of new material, the matrix being finally carried away atom by atom. Even the dentinal tubuli or the uncalcified portion of the cementum may be penetrated by living matter capable of transmitting sensation. In alveolar abscess, the tendency of the surrounding tissue to recovery is well known.

The Dental Cosmos.

Reports of Societies.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The last meeting of this Society was held on Friday, Oct. 12th at 8 o'clock. C. W. Glassington, Esq., President, in the chair.

The minutes of the previous meeting were read by the Hon. Sec. and confirmed, and the following gentlemen—Messrs. Halliday and Mullord, were proposed for Membership of the Society to be balloted for at the next meeting.

There were present as visitors:—Miss Hamburger, and Messrs. Bölger, Douthwaite, Devonshire, Halliday, Klei ne, Lawrence, Mullord, Must, Robertson and Tathereal to whom the president gave the usual welcome.

The President announced the resignation of Mr. T. G.

Jenkin as Librarian to the Society, and that Mr. Sunderland had been appointed in his place.

Casual Communications.

Mr. Lloyd Lavan showed a radicular odontome with a dilacerated crown that he had extracted with a straight elevator, and he also exhibited a very large supernumerary upper central lent by Mr. Sibson.

Mr. T. G. Jenkin passed round several models of cases of Supernumerary and Supplemental Teeth and also of Cleft Palate, which had been kindly presented to the Society's museum by Mr. Boyd Wallis. They were all neatly mounted on stands, which greatly tended to preserve them from injury. He said there had always been a difficulty as to the meanings of the words "supernumerary" and "supplemental." According to Mr. Tomes, a supernumerary tooth was one of the ordinary peg-shaped pattern occurring either inside or outside the dental arch and not partaking of the characters of the adjacent teeth. A supplemental tooth was one which occurred in the dental arch, partook of the character of one of the adjacent teeth and performed its part in mastication.

Mr. Greetham said some few months ago a medical friend consulted him respecting the condition of his tongue which had given him some trouble. The patient was a man about 45 years of age, of a very nervous disposition and greatly given to talking.

On examination of the oral cavity, he found that the tongue was slightly enlarged on the right side, and from the neighbourhood of the 1st Bicuspid back to the wisdom there was distinct evidence of irritation, the colour being darker than normal with the exception of one place some half an inch in diameter where the colour was brighter. Along the upper margin of this space the mucous membrane was abraded with a distinct pit and a hardened spot just below.

Turning to the jaws he found that the patient was wearing a lower red rubber denture carrying two front teeth fixed by means of clasps passed between the bicuspids : the plate had been made some time but had never fitted very closely to the teeth. When he first saw it, the plate at the extreme end could not be said to fit at all. This, together with the fact that the teeth on that side had well-marked cusps, led him to suggest that he should first remove all source of irritation by rounding and polishing the teeth. A vulcanite plate of Ash's No. 1 Whalebone was then made extending the whole side, taking care that it fitted well between and closely to the teeth. At the same time Mr. Greetham recommended that, as he was going with one of his patients to consult a surgeon in town, he might get him to look at the tongue.

This advice was followed, and he consulted the surgeon who advised that, although there was no cancer nor any trouble in the glands, still as a precautionary measure he should snip away that portion of the tongue that was hardened. Being very busy, his friend was unable to lay up for a day or two just then, so said he would postpone the operation. The next time Mr. Greetham saw him, the abrasion had disappeared. the hardened spot was very much less and the tongue was fairly clean, and in fact one was led to imagine that the case was a simple dental one caused by the irritation of rough teeth and a badly fitting plate. As time went on, the hardened spot disappeared altogether, but still the tongue did not improve, and he heard with pleasure that he thought of consulting a well known specialist for the tongue. The result of this visit was, that he was informed that the case was one of Chronic Glossitis caused by the sulphur contained in the denture. He was to remove the plate and the parts would soon get better. This was done, but on seeing him a day or two ago (some time after his visit to town), he found the tongue in much the same condition, and told him that he thought it must be caused by dyspepsia, for undoubtedly the tongue was worse when the condition of the patients' health was such as would lead one to think that he was suffering from that malady.

Mr. Greetham said in conclusion that the point which he would like to bring out in any discussion that might take place was, whether the sulphur in vulcanite affected the tongue or gums, or was the surgeon confounding the colouring matter used in rubbers with sulphur.

Mr. Spokes said he had never heard of the sulphur being condemned before: he thought most likely the surgeon was thinking of sulphide of mercury, but it could not be due to the plate Mr. Greetham had made, which was composed of Whalebone Rubber. During the last few days four cases of malignant disease had come under his notice ; in the upper jaw, in the lower jaw, in the tongue, and one being a Carcinoma of the cheek, and in no case could he find a history of any dental cause to account for the disease.

Mr. Harry Rose described the making of an Irrigating

Tray so as to take a composition impression in about 1½ minutes instead of four, or perhaps five. A suitable model having been selected, it is covered with a layer of wax about an eighth of an inch in thickness, and from this are made a couple of casts and dies in lead and zinc. A piece of German silver plate is struck up to this, over which is struck a piece of meter metal about a quarter of an inch smaller in circumference, and over that again is struck up another piece of German silver one eighth of an inch in circumference smaller than the first. The piece of meter metal is then removed having been placed there to cause the space. Two pieces of German Silver tube are then taken and soldered on to the lower portion of the smaller tray, two holes having been previously cut in the tray to receive the ends of the tubes. The lower portion of the tray is then soldered round the edges to the upper. When the tray is in use, two india rubber tubes are connected with the German silver tubes which form the handle, one of the tubes being connected with a tank placed by the side of the saliva ejector, and the other tube leading to the ejector.

The President then called on Mr. W. Jones for his paper on "Plaster Impressions and Special Trays," which we publish on page 980.

Discussion.

Mr. Harry Rose thought that much credit was due to Mr. Jones for the models that had been passed round, but he thought that a mixture of brickdust or sand and plaster was better for making a special tray than plaster alone. He also said that if a candle or a piece of lighted resin on a stick of wood is held under the impression of the tray for a few minutes, so as to give it a blackened surface, the tray will come out smooth and polished. Mr. Rose did not as a rule agree with Plaster Impressions, as he thinks a little pressure on the parts is better, as it gives the case more of a grip, and also if a plaster impression has to be removed in pieces he did not believe that the pieces could be put together accurately owing to the expansion that takes place.

Mr. Greetham said that when taking a plaster impression, he generally takes an impression with composition first, then cuts about one-eighth of an inch off the surface, and then runs the plaster into this, thus taking the impression in about ten minutes.

Mr. Glassington and Mr. Reeve also took part in the discussion, and Mr. Jones having replied, a hearty vote of thanks was accorded to him for his paper, and the meeting then terminated.

The next meeting is on Friday, November 2nd, at 8 p.m., when Mr. Sunderland will read a paper on "Packing directly on the Model."

Dental News.

ROYAL COLLEGE OF SURGEONS IN IRELAND.

Mr. Arthur W. W. Baker, F.R.C.S.I., and Mr. Theodore Stack, F.R.C.S.I., have been elected Examiners for the Licence in Dentistry of the College. The next examination will be held on Monday, Nov. 12th.

FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

At the meetings of the Dental Board, held 4th to 6th Oct. the following gentlemen, having passed the necessary examinations, were admitted licentiates in dental surgery :—Charles Lea Allnutt, Cape Town; John G. S. Angus, Glasgow; William Stephen France, Blackrod, Lancashire; Hugh M'Kay, Glasgow.

The following passed the First Professional Examination: Thomas B. Carson, James W. Dallachy, James Hepburn, John C. M'Crindle, Wright Sanderson.

DEATH UNDER CHLOROFORM.

At Stalybridge, an inquest was held on Mary Isabella Anderson, aged 20 years, a well-known lady in the town, who died on October 18th under the influence of chloroform. Dr. Crawshaw, of Ashton, administered the chloroform, whilst Mr. Morrey, dentist of Ashton, extracted the teeth. Twenty teeth had to be drawn. Seven had been extracted when the breathing ceased. Dr. Crawshaw had attended deceased nine years, and said he knew the case was a serious one, but feared no fatal consequences.—A verdict of "Death from asphyxia" was returned.

REPORTING A DENTISTS' ASSOCIATION.

Before Mr. Registrar Wild, in the city of London Court, Mr. G. B. Richards, shorthand writer, sought to recover from the defendant, Mr. Goodman, dentist, of Ludgate Hill, the sum of £8 18s.,being the price of a transcript of shorthand notes taken at a meeting of the British Dental Practitioners' Association by the defendant's orders. Mr. Tattershall represented the plaintiff, and tho defendant appeared in person. The plaintiff's case was that in May last year he called on the defendant in consequence of messages received from him, and was told by the defendant to take a shorthand note of all dental matters that came before the Council of the British Dental Practitioners' Association. The plaintiff, not knowing when the sitting of the Council was to commence, was referred by the defendant to a Mr. Slater, of Basinghall Street, the Secretary of the Association, from whom the plaintiff received the required information. He attended the meetings of the Council, and had taken notes of all dental matters. Those he had transcribed and delivered to the defendant. In cross-examination, he said that two of his sons had been in the service of the defendant, who, he believed had been a good master to them, but he did not know that his wife had done the defendant's washing. The defendant said he merely put these questions to show that he had been a benefactor to the plaintiff's family and that the claim now made was a trick. The Registrar said that the sole question was whether or not the plaintiff had been employed by the defendant to take the shorthand notes the price of which was now being sued for. The defendant : I never employed the plaintiff. The Registrar said the evidence before him was that the plaintiff had gone to the defendant's place and had been told to take the notes. The defendant might be the most charitable person in the world, but that had nothing to do with this case. The defendant continuing, said he had never instructed the plaintiff to do what he had done. When the defendant called in May he sent him to Mr. Slater to help the plaintiff to get some work. He was much surprised on receiving from the plaintiff a transcript of notes taken at the meeting of the British Dental Practitioners' Association about a fortnight after the meeting had been held. In cross-examination the defendant said he was not a member of the Council of the British Dental Practitioners' Association, and had nothing to do with the work of the Council.

Mr. John Slater, of Basinghall Street, Secretary of the British Dental Practitioners' Association, was called for the defendant, and he said that the plaintiff had called on him in May mentioning the defendant's name, and had asked whether he (the witness) could do anything for him at the next meeting of the Council of the Association, at which the question of advertising dentists was to be discussed. He had asked the plaintiff to take a report for the British Dental Practitioners' Association. The learned Registrar after hearing further evidence, said that he could not, in the face of the evidence before him, find there had been any employment by the defendant for the work to be done. The plaintiff had failed to make out his case, and he must find in favour of the defendant.

ACTION TO RECOVER A SET OF TEETH.

Harriet Menheniott, of Granby-street, Devonport, brought an action at Stonehouse County Court against Fowler and Co., Donegal Terrace, Stoke, for the recovery of a set of teeth value £10 10s., or the recovery of that sum and £2 2s. damages for detention. Plaintiff, an elderly lady, alleged that she asked defendants to repair a crack in the plate, and that they made a new set without her order. She had had her own set 25 years, and they had been very good friends to her. (Laughter.) Defendants said it was impossible to repair the set, as the teeth were broken, and made another set telling plaintiff it would not cost her much more than for repairing the old ones. His Honour said defendants had no right to break up the set in order to see whether the set could be repaired. At Judge Edge's request plaintiff retired to his room and tried the new set, which did not fit the mouth of plaintiff. After some discussion it was decided to adjourn the case to see if the new set could be made to fit. During the hearing of the case, one of defendants' witnesses in answer to questions by Mr. Martin, said it was useless to explain the process of ascertaining whether a set of teeth could be repaired. Judge Edge, interposing said : I understand. I was once instructed by a dentist. 1 have made a set of false teeth. (Laughter.) At the adjournment, Mr. J. H. Trehane mentioned that defendants had not been able to obtain the services of a dentist who would say whether the new set they made fitted. He suggested that plaintiff, an elderly lady, should go to defendant's surgery and try to be fitted, and if that could not be done she would be supplied with another set. His Honour said he could not compel plaintiff to do that. The manager of the firm did not clearly explain that repairing the old teeth would mean actual reconstruction , and his employers must pay £5 5s for a new set, and £2 2s. damages for the annoyance and inconvenience caused.

Mr. Bellamy, a dentist, sued Mrs. Stewart Dawson of 91, Ashley-gardens, S. W., for £15 odd at Westminster County Court. Plaintiff's case was that defendant had a set of teeth from him about 13 years ago. On 23rd July she came to him and complained that something had gone wrong with them. He found that during the 13 years defendant's jaw had shrunk, and told her she must leave the teeth with him. She complained that it would be very hard to have to shut herself up from society because she had no teeth. Plaintiff told her the only remedy was to have a reserve set, and at once set about taking an impression of her mouth and making another set. She thoroughly well knew that she was to pay for them.

Defendant did not appear, and her solicitor said she was sued in respect of her separate estate. She had no separate estate, nor had she her husband's authority to pledge his credit.

His Honor gave judgment for the amount claimed with costs.

ARE ARTIFICIAL TEETH A LUXURY?

The Sedgefield Guardians have had brought before them the case of a person who had been receiving relief and at the same time had been able to supply herself with a set of false teeth. The guardians reduced the relief from 5s. to 3s. per week. There are many ways of looking at this decision, one is, did she save the purchase money out of her weekly allowance?

The Lancet.

VACANCY.

Liverpool Dental Hospital, 50 Mount Pleasant, Liverpool. The post of House Surgeon is vacant. Applications to be sent to the Dean on or before the 12th inst.

British Journal of Dental Science.

No. 644. LONDON, NOV. 15, 1894. Vol. XXXVII.

GENERAL PATHOLOGY AND SURGERY FOR DENTISTS.

By Edmund W. Roughton, M.D., B.S., (Lond.), F.R.C.S. (Eng.)

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(*Continued from page* 967.)

Sarcoma.

Sarcomata are tumours composed of embryonic connective tissue cells like those seen in developing portions of the embryo.

Four chief varieties are described.

1. *The Round-celled Sarcoma* is composed of round cells which may closely resemble leucocytes in size and shape or may be considerably larger. The cells are embedded in a homogenous or granular matrix, the whole mass being held together by a delicate fibrous meshwork. Running between the cells are a large number of blood vessels with very thin walls; some of them indeed have no walls, but are simply spaces between the cells. (See Fig. 14.)

Round-celled sarcomata may grow from any part of the body where connective tissue exists; their most common situations are the skin and subcutaneous tissues, the bones periosteum, and the lymphatic glands. They form large rapidly-growing tumours of a soft brain-like consistency, and of a dirty-whitish colour, mottled in places by extravasation of blood. In some cases they are enclosed in an imperfect capsule, but usually they infiltrate the neighbouring tissues without having any very definite limit.

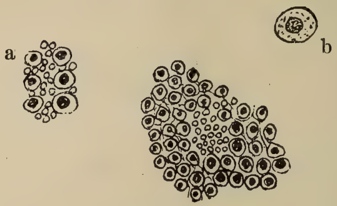

Fig. 14.

ROUND-CELLED SARCOMA.
a.—Blood corpuscles in spaces between the cells.
b.—A single cell more highly magnified, showing nucleus and granules.

2. *Spindle-celled Sarcomata* are composed of cells which are elongated in one diameter. The cells may be oval or oat-shaped, or they may be much longer, having delicate tapering ends. (See Fig. 15.) The cells may be arranged in bundles somewhat resembling unstriped muscular tissue. They are found most commonly in the skin, subcutaneous tissue, bones

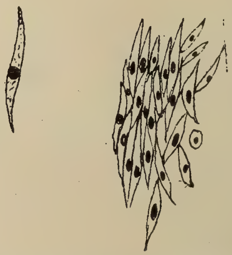

Fig. 15.—SPINDLE-CELLED SARCOMA.

and periosteum. They closely resemble the round-celled sarcomata in naked eye appearance, but are apt to be of somewhat firmer consistence.

3. *Mixed-celled Sarcomata* are composed partly of round and partly of spindle-shaped cells; they closely resemble the preceding varieties.

4. *Myeloid Sarcomata* are characterized by the presence of large multinucleated cells resembling those found in the red marrow of bones. (See Fig. 16.) These myeloid cells consist of masses of protoplasm containing from ten to fifty nuclei. They are surrounded by round, oval, or spindle-shaped cells. Myeloid sarcomata grow chiefly from the interior of bones, especially the lower end of the femur, the upper end of the tibia, and the lower jaw. On section they present a deep red or maroon colour, and are often stained by extravasation of blood.

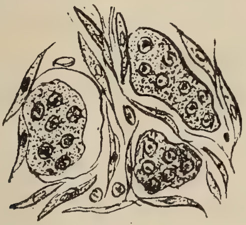

Fig. 16.
MYELOID SARCOMA.

Other varieties of sarcoma are sometimes met with. These are (a) *Melanotic Sarcoma*, which is characterized by the presence of pigment, and which grows from situations where pigment is normally present, viz., the skin and the pigmented tunics of the eye. The cells may be either round or spindle-shaped. (b) The *Alveolar Sarcoma*, in which the cells are arranged in spaces or alveoli. (c) *Glioma* or *Glio-sarcoma*, which grows from the connective tissue of nerve substance (neuroglia). (d) *Psammoma*, which is characterized by the presence of concentric calcareous masses, and (e) *Lymphosarcoma*, which resembles lymphoid tissue.

Secondary changes in Sarcoma.— The most common are—

(a) *Mucoid degeneration.* A clear substance collects in the interior of the cells which gradually distend and liquefy, thus producing cysts.

(b) *Hæmorrhagic softening.* The blood vessels, as already stated, have extremely thin walls ; consequently their contents are apt to become extravasated amongst the tissues. In this way blood cysts are formed.

(c) *Ossification* may take place in those sarcomata which grow from bone.

(d) *Chondrification*, or the formation of cartilage is sometimes met with, especially in sarcomata of the testicle.

(e) *Fibrification*, or development into fibrous tissue, is seen in the less malignant varieties growing from the subcutaneous or intermuscular connective tissue.

Clinical characters of Sarcomata. All sarcomata are more or less malignant, but the degree of malignancy depends upon the situation of the tumour, and the nature of the cells of which it is composed. The nearer the elements of the tumour approach to the character of fully formed connective tissue, the less malignant is it. Thus the round-celled sarcoma is extremely malignant, whilst some of the spindle-celled sarcomata, in which the cells are very elongated, almost forming fibrous tissue, are scarcely malignant at all. Sarcomata are commoner in young than in old people ; their rate of growth may vary greatly, the more malignant growing more rapidly than the more benign tumours. The extreme thinness of the walls of their blood vessels renders them very prone to disseminate throughout the body by means of the blood current. They possess no lymphatics, and consequently do not affect the neighbouring lymphatic glands, with the notable exception of sarcoma of the tonsil, testis, and lymphatic glands and melanotic sarcoma of the skin, in all of which glandular affection is a prominent feature. Those sarcomata which grow from the subcutaneous and intermuscular tissues are nearly always enclosed in distinct capsules, whereas those occurring in the tonsil, testicle, and lymphatic glands speedily occupy the whole organ, and are only encapsuled by its tunic. Even in encapsuled sarcomata the neighbouring tissue is always infiltrated to some extent. When sarcomata approach the skin, they tend to infiltrate it, and eventually ulcerate, forming soft fungating masses discharging a mixture of blood and pus. Recurrence *in situ* is very common after removal. In some cases the recurrent growth is more cellular, and consequently more malignant than the original one. In other cases, the malignancy gradually diminishes, so that recurrence takes place at longer intervals after each removal, and eventually ceases.

The diagnosis of sarcoma is often very difficult, especially when growing in connection with bone, and must be made by a careful consideration of all the circumstances of the case. In some instances the diagnosis cannot be effected until an exploratory incision has been made into the tumour, and even then mistakes are sometimes made.

The prognosis is usually bad, but varies with the seat of the disease. Thus a sarcoma of the tonsil is always rapidly fatal, whilst a myeloid sarcoma of the jaw, or a spindle-celled sarcoma of the subcutaneous tissue is often permanently cured by operation.

Treatment of Sarcoma. Every sarcoma should be removed when possible, and the sooner the operation is done the better the chance of success. It is always advisable to remove a considerable area of apparently healthy tissue as well as the actual tumour, especially in the more malignant varieties. In myeloid sarcomata of bone it may suffice in some cases simply to scoop out the tumour, but in round-celled sarcoma of bone it is advisable to remove the whole bone. Some sarcomata, such as those of the tonsil, are so malignant that it is only rarely that an operation can be of any use.

PAPILLOMA.

Papillomata (warts) are composed of papillæ resembling somewhat those found in normal skin and mucous membrane. They consist of a stroma of fibrous tissue containing blood vessels and lymphatics. The surface is covered by epithelium, the nature of which varies according to the tissue from which the growth springs; thus papillomata of the skin are covered by several layers of squamous epithelium, (see Fig. 17), whilst papillomata of the bladder are covered by columnar epithelium. In simple papillomata the stroma is single and undivided, but in compound papillomata it gives off numerous cauliflower-like branches which subdivide again and again.

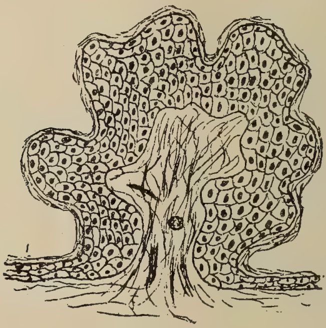

Fig. 17.
PAPILLOMA OF SKIN.

Papillomata are innocent growths, but it should be remembered that in some situations, such as the tongue and lower lip, they are prone to become epitheliomatous, especially in old people. This change may be recognized by the base of the wart becoming indurated.

Treatment. Warts on the skin may be destroyed with nitric acid. From mucous membranes they may usually be snipped off with scissors. When they are at all indurated they should be freely removed with the knife or scissors.

ADENOMA.

Adenomata are tumours composed of gland tissue. A pure adenoma (i.e., one containing no more connective tissue than a normal gland would), is very rare. There is nearly always an excess of connective tissue which may be either fibrous (*adeno-fibroma*), mucous (*adeno-myxoma*), or sarcomatous (*adeno-sarcoma*), The gland tissue itself may be either *acinous* in structure like that of the breast (see Fig. 18) or *tubular* like the follicles of the rectum.

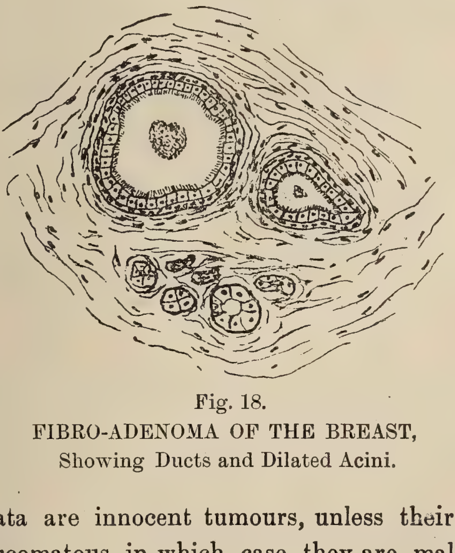

Fig. 18.
FIBRO-ADENOMA OF THE BREAST,
Showing Ducts and Dilated Acini.

Adenomata are innocent tumours, unless their connective tissue is sarcomatous, in which case they are malignant, the malignancy depending not on the epithelial but upon the connective tissue elements.

Treatment. Removal by operation.

CARCINOMA.

Carcinomata are tumours composed of epithelial cells arranged in clusters within spaces or alveoli formed by connective tissue. The individual epithelial cells lie in immediate contact with one another, not being separated by any matrix or intercellular substance. They vary in size and shape, and usually resemble the natural epithelium from which they arise. They are said to multiply both by fission and by endogenous cell formation. The fibrous tissue of which the alveolar walls are composed contains blood vessels and lymphatics. There are three chief varieties of carcinoma, and they differ from each other chiefly in the character of the cells which are found in the alveoli.

1. SQUAMOUS-CELLED CARCINOMA. This variety is usually called *epithelioma*; it is composed of masses or columns of squamous epithelial cells resembling those seen in the skin. These columns grow from the interpapillary processes of skin

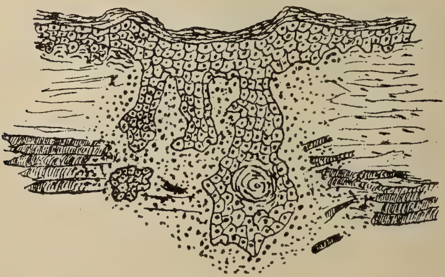

Fig. 19.

SQUAMOUS-CELLED CARCINOMA (EPITHELIOMA.)

Processes of epithelium are growing down into the subjacent connective tissue and muscle. The largest one contains a cell nest. The neighbouring tissues contain an excess of small round cells.

or mucous membrane, and extend into the subjacent tissues, where they throw out lateral branches which, uniting with similar offshoots from neighbouring columns form a sort of epithelial network which infiltrates everything with which it comes in contact. At the same time an outgrowth takes place upon the surface which forms a sort of cauliflower excrescence, unless, as not unfrequently happens, the outgrowth ulcerates as rapidly as it is formed. The cells of epithelioma are usually large and irregular in shape; they are frequently grouped together into concentric masses called *cell nests.* In a cell nest the central cells are rounded, whilst those towards the periphery are flattened out into a crescentic shape. The tissue in the immediate vicinity of an epithelioma is usually infiltrated with small round cells (inflammatory exudation).

Epitheliomata are most commonly situated at the junction of skin and mucous membrane, e. g., on the lower lip, the tongue, the anus, the penis and vulva. They occur in people past middle life, and more often in men than in women. The disease is rare before the age of forty.

Epithelioma may commence as a warty growth, as a fissure, or as a tiny nodule or lump; ulceration occurs at a very early date and proceeds so rapidly that there is usually more ulcer than tumour. The base and edges of the ulcer are always indurated. The rapidity of growth varies greatly; thus on the lower lip the disease may take three or four years to reach the size of a nut, whereas in the tongue a much larger mass may be produced in a few months. The lymphatic glands become involved early in the course of the disease; they become enlarged and very hard. In epithelioma of the antrum and of the interior of the larynx involvement of the glands does not take place until late in the disease.

The diagnosis of epithelioma is usually quite easy when attention is directed to the small size of the tumour, the early ulceration, the induration of the base, the enlargement of lymphatic glands, the situation of the tumour, and the age of the patient. In doubtful cases, a scraping from the surface of the ulcer may be placed on a glass slide in a drop of water, and examined under the microscope. The scrapings from syphilitic and tubercular ulcer are composed of debris of food, micro-organisms, pus, and blood. In scrapings from an epithelomatous ulcer there are numerous epithelial cells of varying size and shape, and sometimes cell nests.

Rodent Ulcer is a variety of epithelioma, which possesses sufficiently distinguishing characters to merit a separate description. It is seldom seen in people younger than forty-five, and is nearly always found on some part of the face, especially the side of the nose near the inner angle of the orbit. It commences as a small wart or papule, which soon ulcerates. The ulceration proceeds almost as rapidly as the growth, so that at no time is there any marked tumour. The ulcer may heal in one place whilst it is extending in another, but the scar is very prone to break down and ulcerate afresh. The progress of the disease is so slow that death usually occurs from some other disease or from old age, before the ulceration has extended to any vital part. The lymphatics are never affected, nor do secondary deposits ever occur. There is no cancerous cachexia, and the disease, if thoroughly removed does not recur. Microscopic examination of a rodent ulcer shows that the epithelial growth is developed mainly in connection with the sebaceous and sweat glands of the skin, not the surface epithelium. Usually there are no cell nests, and the cells are smaller and rounder than those of epithelioma.

2. Spheroidal-celled Carcinoma grows in connection with glands which are lined with spheroidal (glandular) epithelium. There two chief varieties, the *hard* and *soft.*

(a) *Hard Carcinoma* (*scirrhus*) is most often met with in the female breast, where it forms an indurated, irregular nodular mass which cannot be separated from the gland itself. If left alone it soon infiltrates adjoining parts, thus becoming adherent to the skin, muscles, fasciæ and even to the ribs. The glands in the axilla soon become infiltrated, and deposits occur in the internal organs. When the disease has become extensive and has involved the skin or internal organs a general condition of impaired nutrition, known as "cancerous cachexia" is produced. Recurrence after removal is very common. Under the microscope the disease is found to consist of spheroidal cells enclosed within alveoli of dense fibrous tissue (see Fig. 20). To the naked eye the growth presents on section the appearance of an unripe pear or turnip. It is very hard, creaking under the knife, and has a concave section from which a peculiar juicy fluid can be expressed. It has no defined edge or capsule.

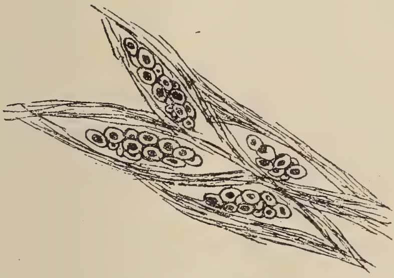

Fig 20.

SPHEROIDAL-CELLED CARCINOMA (SCIRRHUS).

(b) *Soft Carcinoma* (*encephaloid*) differs from scirrhus in that it contains more cells and less fibrous tissue, and is consequently softer and more brain-like in consistence. It is even more malignant than scirrhus.

Treatment of Carcinoma. Whenever it is possible the disease must be completely removed by some *radical* measure such as the knife or caustic. When an organ such as the breast, eye, or testis is the seat of disease the entire organ must be removed. Not only must all visible disease be removed but a certain amount of surrounding apparently healthy tissue must be included in the operation, for the microscope demonstrates that infiltration extends beyond the limits of the disease actually obvious to sight and touch. The complete removal of the disease, of course, includes the thorough extirpation of all affected lymphatic glands. It is obvious that when secondary deposits have occurred in internal organs no radical cure can be attempted. Before proceeding to operate on any given case, the surgeon must assure himself, as far as possible, that he will be able to completely remove the disease. If this cannot be done, he must content himself with *palliative* treatment, which consists in relieving pain by administering opiates, keeping the part clean by means of antiseptics, and supporting the patient's general health as much as possible by food, tonics, stimulants, etc. It not infrequently happens that an operation becomes necessary when some canal, such as the intestine, becomes occluded by the growth. In a few cases it may be justifiable to remove the bulk of a cancerous growth, when a radical operation is impossible, with the object of relieving pain or diminishing fœtor and hæmorrhage.

(*To be continued*).

A GERMICIDE.—The investigations of Drs. Abbott and McCormick, of the Johns Hopkins University, show that a solution containing 7 per cent. of acetic acid is more effective as a germicide than bichloride of mercury.

NASMYTH'S MEMBRANE.*

By F. T. Paul, F.R.C.S.

Gentlemen,—Having been somewhat earnestly requested by your President to furnish something in the way of a paper for the first meeting of the Society this session, I have endeavoured in the short time which has elapsed to put together a few observations, which I hope may prove interesting to you in connection with that department of your science to which I am attached, namely Dental Anatomy. Permit me, however, to lay stress upon the fact that I am not at the present moment prepared with any fully completed work, so that what I have to say in response to your President's invitation will relate to matters which I am endeavouring to work out, and to which I shall hope to add in some future communication. I have selected as the chief item for this evening's discussion the origin and structure of Nasmyth's membrane.

Nasmyth's membrane, I need not remind you, is a delicate horny pellicle which can be removed from the surface of the enamel of young teeth by the action of acids. The principal characters of this structure are :—(1) That it is exceedingly thin. (2) That it presents a reticulated pattern under the microscope, with or without the help of nitrate of silver. (3) That it is of a horny nature as is shown by its indestructability by both acids and alkalies, and by its giving off when burnt the same smell as burnt feathers.

The chief views as to the nature of this structure as set forth in Tomes's Dental Anatomy are familiar to you all. They are shortly :

(1) That it is an exceedingly thin layer of cementum (Tomes).

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* Read before the Liverpool Dental Student's Society.

(2) That it is a final product of the enamel cells. (Kölliker.)

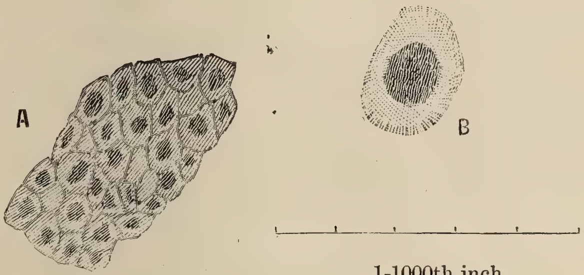
(3). That it is derived from the external enamel epithelium (Waldeyer).

The cementum theory so ably advocated by Tomes has always seemed to me to require further confirmation, I thereset myself to work at Nasmyth's membrane, and the following are the results obtained.

Method employed : Young unworn teeth, human, monkey, and sheep, were placed in 2 per cent. solution of bichromate of ammonia for one month, then after washing transferred to two or three changes of spirit, and finally placed for decalcification in a 5 per cent. mixture of nitric acid and weak spirit. As soon as the enamel was softened, the tooth was placed in a watchglass full of water, and the membrane torn from its surface with needles. It was then stained in eosin, and mounted in Farrant's medium.

Specimens obtained in this way showed the reticulated pattern at once and without any treatment with nitrate of silver. Now it has been assumed that this appearance might be due to the impress of the terminal ends of the enamel fibres; but against such a suggestion is the fact that the pattern is at least ten times too large for the enamel prisms. Measurements, however, are unnecessary to prove that the pattern is produced by the outline of epithelial cells, since in many of them the nuclei are quite as visible as the margins. I think it is only necessary to look at a specimen obtained from the canine of a young adult to accept the fact that a layer of epithelial cells enters into the composition of Nasmyth's membrane, whatever difficulties there may be in accepting this view. (See Fig.)

Epithelial cells, however, do not apparently account for the whole structure, for the shreds of membrane removed curl up like the fenestrated membrane of Henle, when torn from the inner coat of an artery, and the curling is seen in some specimens to be due to the presence of a thin structureless membrane on which the epithelial cells are placed. So thin and so clear is it that I only ascertained with great care that it was placed between the cell layer and the enamel. At first it seemed probable that this transparent membrane was of mesoblastic origin, and corresponded to an original basement membrane placed between the enamel organ and the tissues of the gum. If so, of course I should have met with it external to the epithelial layer, whereas it was between the epithelium and the enamel prisms, and must therefore be a product of the enamel organ itself, perhaps Kölliker's final product of the enamel cells.



A. Portion of Nasmyth's membrane for adult human canine stained with eosin; drawn to scale with Abbe's camera lucida.

B. A cell more highly magnified, showing cogged margin.

I make out then that the structure of Nasmyth's membrane consists in a layer of polygonal, flattened epithelium, measuring about 1-2000th inch broad, and up to 1-1000th inch long, placed upon a thin, structureless, elastic membrane. When a tooth has been decalcified in a strong acid aqueous solution, like Hopewell Smith's, I have easily been able to obtain the structureless lamina, but not the epithelial layer, and it appears probable that different methods of preparation are chiefly concerned in the diversity of views expressed as to its structure.

The next point to determine was the origin of the membrane. As is well known an immature tooth whilst still beneath the gum is contained within a tough fibrous sac,the dental sac or follicle. I hardened some teeth from the sheep and the monkey in this condition. On dissecting them it appeared that at a certain stage the crown of the tooth was quite free inside the sac, but that at a slightly later stage the sac adhered to the tooth although it could be quite easily stripped from it. At the neck of the tooth the sac was continuous with the fibrous membrane from which the cementum and alveolo-dental membrane are developed.

On cutting sections of the dental sac in its free condition, I found that it was composed of a thick vascular fibrous coat, lined internally with a thin layer of epithelial cells arranged after the manner of the external enamel epithelium, which it undoubtedly was. On subsequently examining the adherent sacs I found that the epithelial lining was wanting, and that the fibrous layer only was present. Under these circumstances it was fair to assume that the external enamel epithelium had come in contact with, and adherent to the surface ef the enamel, an assumption which was proved to be correct, since by firm scraping of the surface of this enamel under water I was able without the help of acids to remove shreds of membrane coated with a layer of epithelial cells, the nuclei of which were distinctly visible.

Now if these observations are correct, and of course they need corroboration—I shall endeavour to corroborate them myself and I shall be much pleased if some of you will do the same—if, I say, they prove to be correct, it may be considered an established fact that Nasmyth's membrane is an epithelial structure and is derived from the external enamel epithelium. But how about the observations of others? Theories may of course be wrong; but careful observations by good men it is best to assume are correct, and when Tomes says that he finds encapsuled bone lacunæ in connection with Nasmyth's membrane in pits in the enamel, I accept his observation as a fact, though I dispute the theory he builds upon it. Tomes bases his view that Nasmyth's membrane is a thin layer of cementum chiefly upon the following observations :—1. In several mammalians it is normal for the enamel of the crown to be covered with a layer of cementum. 2. It is not uncommon to find in human teeth that the cementum overlaps the enamel at the neck. 3. Nasmyth's membrane when loosened by acids comes away attached to the thin layer of cementum at the neck. 4. Thin layers of cementum present a structureless appearance under the microscope. 5. When Nasmyth's membrane appears to fill up a pit in the enamel bone lacunæ may be met with in it. This sounds like a strong case for the cementum theory. Still another interpretation is quite possible, and indeed equally reasonable. The only observations of Tomes relating to the membrane itself are the occasional presence of lacunæ in it, and its connection with the cementum at the neck of the tooth. I admit the correctness of these observations, though I have not been so fortunate as to find the lacunæ myself. At the same time I assert that the definite presence of an epithelial layer is indisputable, and if Tomes's observations are correct they must be accounted for consistently with this fact, which as it seems to me is not at all difficult. Every reason urged by Tomes in favour of the cementum theory is equally in favour of the possible occurrence of cementum outside a true Nasmyth's membrane. The cementum organ of the herbivora is the connective tissue wall of the dental follicle, whilst as I have endeavoured to show the epithelial lining of the follicle forms Nasmyth's membrane. Both layers are present in human as well as herbivorous teeth. Hence it seems quite reasonable to assume that, under the the exceptional circumstances of a deep pit in the enamel, it should be filled, not by an overgrowth of this thin horny pellicle, but by connective tissue derived from the outer wall of the follicle, which might then undergo in the human subject that change which is constant in many animals and in other parts of human teeth, namely conversion into bone. Such a view would reconcile the apparent discrepancies between all observers. A fresh observation is however wanted to complete the case ; it is the discovery of a horny or calcified, flattened epithelium between the enamel and cementum in herbivorous teeth. Up to the present I have only had time to make one attempt to discover this. I split some properly prepared sheep's teeth and partly decalcified them ; then deep down between the cusps I removed the cementum and scraped the surface of the enamel. Among the scrapings was one piece of a distinctly epithelial nature. This would be the piece of evidence wanted if only one could be positive that no error could possibly have crept in ; but though I believe that I followed this particle from the inner enamel to the micro-slide, it is no doubt possible that it was liberated from some other part of the tooth. The observation therefore awaits corroboration. My belief is that in all compound teeth consisting of layers of dentine, enamel, and cementum, there constantly exists between the two latter a remnant of the external enamel epithelium in the form of Nasmyth's membrane, and I think it should be demonstrable, because for instance in the germs of sheep's teeth, the cells of the external enamel epithelium are large, numerous, and distinct, and by no means look as though they were functionless and likely to disappear, leaving no trace of their existence.

In regard to the other observation of Tomes referring to the connection of Nasmyth's membrane with the cementum at the neck of the tooth, it is easily explained in view of the origin of the former from the external enamel epithelium. In such case it, like the enamel, would be slightly overlapped by the cementum, and when the two are loosened by acids it is only natural that they should come away together.

Now as regards Kölliker's view that this structure is a final product of the enamel cell. It seems to me that this view also is not at all inconsistent with my results. As I have pointed out, there is a clear, structureless lamina to which the epithelial cells adhere, and which is placed between them and the enamel. Is it not possible that when the external enamel epithelium becomes adherent to the enamel, the adhesion is effected through some final product from the enamel cells themselves. If so, Kölliker's observations are correct so far as they go, but are not complete.

I have now, gentlemen, urged all that I have to say in favour of the view that Nasmyth's membrane is chiefly an epithelial structure derived from the external enamel epithelium. I believe it is present in most if not all teeth, though it may often be very difficult if not impossible to demonstrate it. The points which I have raised are far from settled. Indeed I am sure that much patient and skilful work will be needed before all doubts are solved, and the comparative histology of this subject has been satisfactorily worked out. It may seem to you a very small matter upon which to spend so much time and energy. But are you sure that it is a small matter? Is this structure to be regarded as functionless? It is chemically far more resistant than the hard enamel itself. May it not protect the enamel from those chemical changes constantly at work in the mouth? It is true that on exposed surfaces it readily wears away, but in pits and hollows and over the surfaces between the teeth it would not be subjected to this wear and tear, and in these, the most vulnerable points, it would remain, and may possibly constitute a valuable protecting agent. To carry the suggestion still further. Is it not possible that some of the friable, perishable enamel so prone to early decay may be enamel devoid of Nasmyth's membrane? If derived as I think from the external enamel epithelium, that epithelium is directly continuous with the surface of the gums, and may be supposed to readily participate in any inflammatory changes affecting them. Or it may be damaged or destroyed by too early lancing of the gums, and so opening the dental follicle before it has become adherent to the surface of the enamel. Under such conditions Nasmyth's membrane might be absent, and it seems reasonable to suppose that enamel devoid of its protection could hardly compete with that which is shielded by it. Such views are I am aware of a very speculative nature, but I suggest them to you because I wish to gain the interest of clinicians as well as biologists, and to encourage you all if I can to join with me in trying to work out as far as we are able the origin, structure, and functions of Nasmyth's membrane.

Before concluding, I should like to say a word or two to the student members of this Society on the general subject of dental histology. I wish to remind them how very much there is yet to be done in this branch of dental science, and to encourage them, if possible, to take some share in it. Even in respect of the little detail of structure we have been considering this evening, there remains a great deal to be discovered, and yet how small an item it is compared with any of the more important tissues. Modern methods have revolutionised this department of study. Under their influence the the whole field of dental histology is re-opened, and the entire animal kingdom awaits fresh investigation. Just now a great impetus has been given to this study. An entirely new method has been introduced by which the soft tissues after fixing and staining are petrified and ground down together with the hard structures. This method offers, though with great labour and many disappointments, preparations which previously were impossible. I am fortunate in being able to show you a portfolio of microphotographs just brought out by Drs. Röse, of Freiburg, and Gysi, of Zurich,* which are very beautiful and of great scientific interest; among them you will find examples of sections prepared by this petrifying process. I have made some trials of the method, and whilst recognizing that it has certain special advantages over every other process, I am of opinion that the best line of research for general purposes is still by careful decalcification of the hard tissues, and I would direct your energies rather towards the perfecting of these methods than to too much loss of time over the petrifying process. Mr. Hopewell Smith, of Boston, who seems to be an indefatigable worker, and who has published for students some admirable papers on dental histology, has devised a process for rapidly decalcifying bone and dentine which yields excellent results. He has been so good as to send me an example of his work, which I have much pleasure in submitting to your inspection. It proves that, notwithstanding the use of a strong acid solution, the delicate tissues of the pulp may still be remarkably well preserved. Details of Mr. Hopewell Smith's method are given in the *Dental Record* for September, 1894. If you undertake any research on this subject I would advise you to spare no pains in obtaining primarily a perfect fixation of the soft tissues, otherwise they are very liable to shrink and change. The bichromates, though possessing the great advantages of rapid penetration and easy subsequent staining, are not I fear to be altogether relied upon. And I would rather advise you to experiment with Flemming's solution of chromic, osmic and acetic acids; or Hermann's fluid of Platinic chloride, with osmic, and acetic acids: or chromic acid and spirit in the dark, as being more perfect fixative agents, and likely to yield better results. I feel sure that it is in the direction of decalcification that we must work, and I would like therefore to encourage you to take up this subject. But the scope for original work in dental histology is simply unlimited, and I shall therefore hope to learn that the session we are inaugurating to-night is characterised by the original nature of the communications submitted to the Society; for I am sure I need scarcely remind you that the careful and correct record of a very short and simple piece of work the result of painstaking personal investigation is of far more value and far more scientific interest than the most elaborate paper compiled from the labours of others.

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* The port folio, containing 12 large microphotos and 12 engravings from them, can be obtained from Dr. Gysi, Börsenstrasse, 14, Zurich, at a cost of about 21s.

PRESIDENTIAL ADDRESS.*

By W. Dougan, L.D.S.I.

Gentlemen,—It is with feelings of the greatest diffidence that I address you this evening. After all the brilliant addresses of the able orators who have preceded me in the presidential chair, my efforts must appear, as I know they are, very commonplace indeed; the more so as I am about to speak upon a somewhat well-worn topic and one which has already formed the theme for many similar discourses. It is also a subject about which I feel that I know nothing whatever. Not that I mean to claim any originality for taking up a subject upon which I am not well informed, since I find it is already a time-honoured practice for both scientific and political speakers to talk most about that which they least understand.

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* Read before the Manchester Odontological Society.

This thought gives me courage to lay before you some facts which bear upon the question, whether the teeth of the present generation are equal to, inferior to, or better than those of the generations that have immediately preceded us.

It appears to be tacitly admitted by nearly every one, that the teeth of the present generation are wofully inferior to those of, say, fifty years ago; and while I do not wish to contend that they are either better or worse, I wish to call your attention to certain facts and conditions which may make you reflect ere endorsing the generally received opinion. Formerly as you know little attention was paid to the conservation of the teeth, so that when the teeth of young people decayed, little notice was taken of it. Now, on the contrary, when young people have bad teeth, they are always at the surgery of their Dentist, who thus becomes impressed with the idea that their teeth are phenomenally bad, whereas formerly their teeth would have decayed away, and he would have known nothing about it, unless he came to replace the lost teeth by artificial ones, when it would not attract his attention to the same extent. Dentists who have practised forty years or so will tell you that in their younger days it was not uncommon to see even well-to-do ladies going about without their front teeth. It might be supposed that a question of this sort could be readily settled by the examination of the skulls of those who died fifty years ago, comparing their teeth in respect of number and quality with the teeth of the present day, but I hope to show you that an opinion formed from such data would be very misleading owing to the great alteration which has taken place in the conditions of life within this period. Statistics also are not very satisfactory, as with a little manipulation they can be made to prove almost anything you wish ; a fact not lost upon politicians, company promoters, and actuaries of Insurance companies. Formerly also people died on the average at an earlier age than now, so that they would naturally have more and better teeth when they died than would the people of the present generation who live somewhat longer.

The inventions of nitrous oxide gas and chloroform have had a great share in bringing about the loss of teeth in the present age, but a much more potent factor is found in the enormous increase of unscrupulous advertising dentists who by the aid of anæsthetics must have removed vast numbers of teeth which but for their attention might have rendered their owners useful service until they died. Consider for instance, the recent case of an advertising dentist who had to pay £150 damages for extracting all the teeth of a servant girl without her consent or knowledge while she was under the influence of an anæsthetic, which teeth at the trial were shown to have been nearly all good useful teeth. To what extent this practice is carried on we can only guess, but from what we hear and from occasional disclosures in the daily press it must be enormous. But while the advertising dentist of the ordinary type is thus busy thinning out the teeth of the middle and working classes, the teeth of the man of wealth are not neglected ;—the advertising crown and bridge worker is giving him every attention. By means of wretchedly constructed, badly designed bridge-work, attached to teeth improperly prepared or shaped, he can in a few months bring about the loss of several additional teeth, which in some cases would have endured for their owner's lifetime. So the merry game goes on; rascality triumphs, and the public pay heavily for it. It is a curious fact that this latter class of work, requiring as it does the greatest skill, care, and judgment, should be practised by the most incompetent men, but 'twas ever thus—" sinners rush in where angels fear to tread."

It appears likely that the public will continue to be fleeced and imposed upon unless we can arouse the profession to a sense of its duty to rigorously enforce the provisions of the Dentists' Act and so protect the public from such unscrupulous men.

You will see that even if it be true that the teeth of the present day appear worse than those of, say, fifty years ago, this by no means proves that they are actually so.

Some of the theories put forward to account for this assumed deterioration of the teeth are quite amusing. The favourite idea of the lay public is that it is all caused by the water we drink. One day when I was filling teeth for a child, his mother assured me (as I have often been assured before and since), that in Manchester the teeth were especially bad because the water was so soft. An hour or so later a lady from Southport informed me that all the teeth there decay because the water is too hard. We need not be surprised that the lay public should imagine this. The idea may have arisen in the first place from noticing medical men order lime water to be added to an infant's milk; they might conclude that the lime so added would assist the formation of teeth and bone. That lime water can be digested or have any nutritive value is an idea not held by any medical authority in this country; it is never alluded to in text books because it is not imagined that any medical practitioner can find any use for it, and at the present time the more thoughtful practitioners doubt whether lime even in the form of chemical food is of any benefit whatever to a rickety child, and when they order chemical food do so regarding it simply as a good preparation of iron and only useful as such. Again, efforts are sometimes made to show that our dental troubles are all caused by the too careful removal of the bran and husk from our meal and flour, but this idea is altogether fallacious, for although chemical analysis shows the bran to contain a large proportion of lime salts, the digestive secretions are unable to act upon it, and even when given to a horse, the bran passes through his digestive tract unaltered, and the only useful purpose it serves is to irritate his bowels and so produce a laxative effect.

Yet transatlantic writers are greatly enamoured of these theories; so much so, that I have even seen it recommended by one of them to cap exposed pulps with a preparation of phosphate of lime, the idea being that the pulp would assimilate the lime and so form a new bony covering to itself. Acting upon this theory we should only require to apply a beefsteak to the arm of a man whose biceps are too small, and leave nature to do the rest.

Another favourite idea with many writers is that our teeth are bad, and our jaws small because they are not sufficiently used; that in fact our food is too well cooked and does not necessitate sufficient mastication. Now although it is a well-known axiom that an unused organ deteriorates, still, in the case of the teeth there are so many nations who have better teeth than Europeans although they use softer food, that this theory can hardly be accepted as a satisfactory explanation. We have it upon authority that in England there is consumed more butcher's meat than in any other country, and yet few people will doubt that the teeth of the Irish and Scotch peasantry are, upon the whole, somewhat better than are those of English people, although butcher's meat is almost unknown to the bulk of them, and these peasants live almost entirely upon porridge and other soft food. Many Eastern nations who live upon rice are reputed to have but little trouble from their teeth, and the porridge-fed Zulu is remarkable for his excellent teeth. Another theory is that the cause may be found in that close application to school and lessons now so general in this country and on the continent, and in the great strain upon the nervous system of individuals engaged in commercial and professional life. The idea is that the stream of nutriment which should go to the teeth is thus diverted to the brain,—an ingenious idea, but one which is, after all, the merest conjecture, alike incapable either of proof or of disproof. Physiologists who are most capable of forming an opinion say that it is most unlikely that this could take place. If anything of this sort were possible we should naturally expect that the upper classes who are most highly educated, and whose occupations are in general of a character to entail nervous strain, would have the worst teeth, but I think you will all agree with me that this is not the case.

Others attempt to account for this assumed deterioration in the following way : As you know, the death-rate has decreased considerably within the last fifty years. In the case of children under the age of one year, there is no practical difference, because as to that age the conditions remain the same now as then, but in children from five to fifteen years of age the death-rate has fallen about one-third. Now the theorists whom I am now considering, being men who have fathomed the secret designs of nature, hold that it is her plan to kill off the weak by means of zymotic and other diseases, and spare the strong; and they argue that formerly when the death-rate amongst children was greater, the weak ones died, and those who survived were the strongest, and consequently had better teeth than people now have ; but if this idea were not entirely fallacious we should at the present time find in the slums of our large towns (where the death-rate amongst children is greatest) people with the best teeth and otherwise exceptionally strong, but is this so? do we not find there people whose vitality is little more than sufficient to enable them to keep alive?

In 1851 the population of town areas in England and Wales was just over 9 millions, and that of country areas just under 9 millions, i.e., the two were practically equal. In 1881 it was in town areas 15½ millions, and in country areas 10½ millions, an increase of town dwellers by one-third. In

1851 the death-rate for all ages for town areas was 24·7 per thousand, and for country areas 19·9. From 1882 to 1886 for town areas the death-rate was 20·3 and for country areas 17·7. You will notice that while there has been a considerable decrease in the death-rate of both town and country, the decrease has been most marked in the town, and at the present time the town dwellers live under quite as advantageous conditions as did formerly their fathers in the country , and I am not sure but that if we leave out of consideration the slums of our large towns, they now live under very much better conditions. Further, you must remember that it is in town areas that the heavy death-rate amongst young children is found, and this goes to swell the total towns' death-rate and make it appear larger than it otherwise ought to be. This heavy death-rate amongst young children is mainly caused by their mothers leaving them to go to work in factories ; a condition that does not obtain to anything like the same extent in the country. It is an axiom with officers of public health that the people tend to become healthier if they are only allowed to do so. By the removal of, or the lessening of, conditions favourable to the causation and spread of disease, you make the weak ones become strong and the strong still stronger ; so that, while we have not yet reached perfection, having, in fact, merely made a commencement in sanitary science, there never was a time when there were so many athletic men or such tall and strapping women in England as there are to-day. Contrast the condition of the working classes fifty years ago and now. They are now better fed, better housed, better clothed, more temperate, work shorter hours, and while they work, it is under much healthier conditions than formerly. While the improvement has been greatest in the condition of the working classes, it has been general in all classes throughout the country.

It is quite true that there is unfortunately at the present time a greater consumption of patent starchy foods than formerly, and if these are given to very young infants they are injurious. Of course they can do no harm when the child is older, still we sometimes see bad teeth in children who without doubt have been properly fed, but we have yet to learn that the mothers of fifty years ago were any wiser or fed their children with greater discrimination than do those of to-day. Mistakes must have been at least as common then as now.

Figures can give you but little idea of the great improvement which must have taken place in the general health of the community. When you see that the death rate has fallen one-sixth it does not mean that the community all round are only one-sixth healthier ; it means a great deal more, because do what you will, you must die at least once, and if the conditions are so altered that people live on an average a few years more, it means a very great increase in health and vitality, and a freedom from numerous small ailments which tend to lower vitality, although not in themselves sufficient to kill the individual. I would suggest that if you were to ask the first dozen men of average intelligence whether the people now living are any healthier or stronger than formerly, they would one and all assure you that they are not; yet if you put the same question to a dozen officers of public health, men who have studied this subject, they will tell you that they have no doubt, having regard to all the pros and cons of the case, that the people now living are on an average healthier, bulkier, live longer, and have fewer ailments than formerly. In face of this you are asked to believe that while this improvement has been going on, the teeth have been steadily deteriorating, a paradoxical line of argument that does not commend itself to me. Supposing that the teeth are really deteriorating, we know that changes of this sort usually take place very slowly, and it would probably take a hundred years or more to make a marked difference.

At the present time we have no actual proof that the teeth are either better or worse than they were say fifty years ago, and until we get the results of careful and systematic examination of the teeth of school children, extending over a great many years and embracing all classes of society, it seems to me only a waste of time to frame theories to account for something which we do not know to exist. Would it not be better under these circumstances to say, as your essayist does, that we know nothing whatever about the matter ?

INFANTILE SCURVY.—Dr. THOMAS BARLOW, in the Bradshaw Lecture, discussed a group of symptoms occurring in infants after the age of four months, principally between nine and eighteen months. The child is generally rickety, and suddenly, without obvious cause, becomes fretful in a special way. So long as it is left alone it is tolerably quiet, but on movement it soon becomes clear that pain is connected with the lower limbs where some obscure swelling may be found round the shafts of the bones above the epiphyses. The condition of the gums is considered very important, and depends upon the number of teeth which have appeared. If there are none present the gums may be normal ; if several, considerable sponginess may be manifest and fleshy swellings form which may even project from the mouth and give rise to bleeding and fœtor. If there are only a few teeth the sponginess may be slight though definite, forming a narrow fleshy ridge round each tooth. In the great majority of cases where complete details have been obtained, the infants have been nourished on what may be called " preserved foods."

British Journal of Dental Science.

LONDON, NOVEMBER 15th, 1894.

DENTAL COLLEGES.

In his address at the opening of the Paris Dental School, Dr. León Labbe, who presided, declared he would defend the interests of this *école libre* and that it was only specialists such as those attached to the school who could give the necessary technical instruction. Dr. A. P. Merrill has recently addressed the Dental Association of Victoria as to the necessity of establishing a dental college, and whilst admitting that the system of English teaching was nearly all that can be desired, being complete in many respects surgically and mechanically, was yet in favour of "the other system" of independent college training. He thought it produced the greatest proficiency in technical skill and should be adopted in the Colonies, and that the people and wants of the public demand a quicker return in dental education than the surgical curriculum in Great Britain gives. We do not propose on this occasion to enter upon the question as to what proportion of general medical and surgical knowledge it is necessary to demand of a dentist, but it seems a convenient moment to compare our Schools with foreign ones, "free" and "independent" as the latter may be. It may be supposed that the benefit resulting from being able "to see ourselves as others see us" would lead to an attempt at reformation, and to a more liberal view of what we consider are others' failings. But whether from the impossibility of accurately observing our own position, or from a disinclination to make the attempt, it remains a human characteristic to imagine our own methods the best and our own rate of progression as the safest. True, there are always some in favour of changes, more or less revolutionary, to be introduced more or less abruptly, but the conservative tendency of the majority runs much in the direction indicated above. Fair criticism, however, when based upon a correct statement of fact should always meet with respect.

In most civilized countries there is now some regulation of the practice of Dental Surgery. In Great Britain we have a Dental Register under the control of The General Medical Council. The production of a Diploma is necessary for admission to the Register. Compliance with the curriculum of a Royal College, or a Faculty, of Surgeons is requisite for the obtaining of a diploma. It may *seem* a complicated process, but where in our critics' eyes, is the weak point in this scheme? We imagine that attention would be called to the dependence of the Schools upon the course of study demanded by the Colleges of Surgeons, and that the only alternative would be in the direction of an independent dental authority granting certificates or licenses. We believe that there are still a few amongst us who regard some such system as an ideal one, and it is a matter of history that at one time there seemed some possibility of its realisation. But with the passing of the Dentists' Act of 1878, a new era was inaugurated and the legal position was established.

Without doing more than merely to allude to the improved professional status gained by association with the Royal Colleges of Surgeons, we pass on to consider whether, so far as the teaching Schools or "Colleges" are concerned, there is not, practically, a freedom which is occasionally overlooked by our critics. Freedom in granting certificates, licences, or degrees, for practice they certainly have not, and, according to our views with a beneficial result. The competition indulged in by our Schools, Provincial or otherwise, is not as to how many certificates to practise they can grant, but (apart from providing for the physical comfort and convenience of students) only as to how well they can prepare their Candidates for the ordeal of the independent licensing authorities. The use of the word "independent" certainly needs a moment's pause, however, when we reflect that all the licensing bodies are not altogether free from the control of the General Medical Council. But in the same way that the Schools are practically "free" so also are the licensing Colleges—voluntary parts of a harmonious whole. At present, so long as the lecturers comply with the necessary curriculum, the methods of instruction are not interfered with and it is well understood that only dentists can teach the special operative details to the future candidates. The Dentists' Act also provides for the proportional representation of registered Dentists upon the Boards of Examiners. So we may safely say that no fault can be found as to a lack of freedom in teaching within the lines of our curriculum; indeed in the matter of mechanical training, as we have occasionally pointed out, there is perhaps too much freedom, and when this branch is systematically taken up by the existing, or other "free", schools as we are prepared to find will be the case, no more stringent obligations will be necessary. We think then, that our critics must still remain content to attack our curriculum and not attempt to show that latitude is not allowed to dental specialists in teaching the next generation of dentists. In view of the new law in France, our schools are quite as free as the *ecole libre* of Paris. Let us hug such chains as we have, and congratulate ourselves that of no one of our schools can it be said, "It hopes to get rid of its debt—by Degrees." Dr. BEERS, who quoted this *double entendre* the other day in his introductory address at the Dental College of the Province of Quebec, bore testimony to the unanimous vote of his fellow practitioners in favour of affiliation with Laval and McGill Universities, and we are glad to know that the best leaders in America are in favour of a dentist being something more than a "tooth carpenter."

THE DENTAL HOSPITAL OF LONDON.—The Annual Dinner of the Past and Present Students will be held at the Hotel Métropole on Saturday, December 1st. The Chair will be taken by S. J. HUTCHINSON, Esq., an old friend of the Hospital, and formerly a member of the Teaching Staff.

Cellular Pathology.—In his introductory address at Glasgow University, Professor Coats alluded to the advance made in our conceptions of life. The cells are still regarded as the active units in the living body both in health and disease, "but we now look more clearly into the varying endowments of these units and the sources of these endowments." We are led to suppose that in the nucleus of the germ cell, and in varying degrees in other cells, there are still more minute vital units, in which are embodied the forces of life. It is suggested that each individual constitution is made up of a number of particulars, each represented in the single cell from which the individual was developed. This particulars of constitution differ in susceptibility and tendency to certain forms of disease and in the power of resistance to the agents which cause disease. "These are all practical considerations, and thus it is that pathology, in this as in other instances, having its foundations on the deepest problems of life, is also in touch with the everyday experiences of the medical practitioner."

Perforation of the Soft Palate.—At the last meeting of the Pathological Society, Dr. E. W. Goodall related a series of cases in which the soft palate had been perforated in the course of scarlet fever. They were fourteen in number, and in each case it was the anterior pillar of the fauces which was perforated, and this occurred between the ninth and the twenty-eighth day. The perforations might be single or multiple, and although he had seen a similar condition in diphtheria the speaker considered that it was almost diagnostic of scarlet fever. He showed at the meeting one of the most marked perforations which was taken from a girl six years old. Both tonsils had sloughed and there had been superficial ulceration of the soft palate and uvula during life.

National Dental Hospital.—The Third Annual Cinderella Dance given by the students of the National Dental Hospital will be held on Tuesday, November 27th, at the Portman Rooms. Application for tickets should be addressed to Messrs. Nicholls and Tice (Hon. Secs.), at the hospital. The Students' Dinner takes place at the Holborn, on the 30th, Sir Walter Foster, M.P. in the chair.

A Gas Explosion at a Dentist's.—We regret to read in the Liverpool papers the report of an inquest as to the death of a butler in the service of Mr. F. Rose, of Mount Pleasant. An explosion of gas occurred in the early morning in a room used as a second surgery, some thirty feet from the workroom. Asked by the coroner if he could account for the accident, Mr. Rose suggested the following interesting theory. In the door of the surgery where the gas escaped, was an opening for the purpose of creating a draught, and when the deceased opened the door of the workroom, where a fire was burning, the sudden strong draught thus occasioned carried the gas from the surgery through the ventilator across the hall towards the workroom, where the fire ignited the gas, and an explosion followed. The position of the building and the hall through which the current of gas would be carried resembled theoretically a huge Bunsen burner.

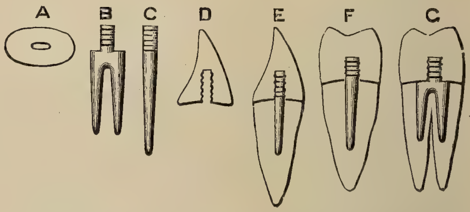
Extirpation of the Inferior Maxillary Nerve.—At the annual meeting of the American Dental Association, Dr. T. W. Brophy described a new operation for the resection of the inferior maxillary nerve. He enlarges the mental foramen until the opening is in a line with the inferior dental canal in the body of the bone. Then an exaggerated form of a Donaldson broach is thrust in and revolved so that it divides the nerve, which is withdrawn in exactly the same way as a pulp is extirpated. Dr. Brophy showed a divided mandible to illustrate the practicability of the operation, and also the instruments which he has devised for performing it. He has, himself, had the happiest results, and claims that the whole of the nerve as far back as the inferior dental foramen can thus be removed without wounding the face sufficiently to form a scar. The short time necessary for the operation is also an advantage.

Manipulative Miscellany,

It is requested that all new instruments or articles which it is wished to have described under this heading, be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being to give practitioners a description of everything new, on its own merits and without any intention or wish to pit one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

NEW CROWN AND PINS.

Messrs. Rutterford & Co. have introduced some new mineral crowns and pins, their chief features being strength and simplicity of adaptation. The crowns have *elliptic* apertures instead of circular—thus greatly increasing strength—these are roughened within, and the pins are similarly treated to ensure firm grip of the cement. The pins are both elliptical and tapered, and a special feature is the double-pin for divided or very flat roots, by which arrangement very little dentine need be removed, and yet the double-pin can be introduced deeper than any single or cylindrical one possibly can be.



The union of these crowns and pins with ordinary white filling is so secure that a dead weight of 100 lbs. has failed to separate them, yet should accident split a crown, it can readily be replaced without removing or interfering with the pin or root.

Abstracts of British & Foreign Journals.

CASE OF RESTORATION OF THE NOSE WITH PORCELAIN.

By A. G. Smith, D.M.D., Peori, Ill.

Cleft and perforated palates, broken and dislocated jaws, restoring portions of the face lost through disease or accident, the treatment of nearly all facial neuralgias and many other deformities and affections have in recent years come to be recognized as lying properly within the province of dentistry. We have long been used to the idea of restoring certain features of expression—namely, the teeth and gums—with porcelain, and it is universally conceded that with this material alone it is possible to produce natural and artistic effects. Although porcelain has proved so useful in restoring the organs just mentioned, it is only very recently that any one has thought it possible to extend its usefulness to correcting that most hideous and repulsive of all deformities—namely, a missing nose. I first tried rubber, as I was already familiar with the working of this material, and because it had been used numbers of times previously for like purposes, but the results were unsatisfactory. This was owing to the fact that the finishing process marred the contour, while, of course, the matching of the complexion could only be approximated by painting, which always leaves a "dead" surface whose artificiality is as readily apparent as that of an undraped wooden leg. With porcelain, however, the case is different. The translucency of the material, the slightly granular and uneven appearance of the surface, the accurate flesh tint that can be obtained in the material itself, all these properties make far more artistic results possible than with any other known substance. Also, the proper colour once obtained, the work is as durable and as unchanging as any other piece of china.

In this particular case, the patient was a young man some nineteen years of age, and apparently the major portion of his face between eye-brows and chin had been destroyed through the agency of hereditary syphilis, which made its appearance at an early age. All bony and cartilaginous portions of the nose were destroyed; the hard palate was perforated; the turbinated bones were absent as well as the vomer. The floors of both orbits were absorbed, especially under the left eye, where a fold of skin had healed in far back under the eyeball, pulling the lower lid down and forward, giving the patient a most uncanny expression. The sight was unimpaired, though the lids could not be made to meet over either of the eyes.

The disease having been in a quiescent state for some years the work of restoration was undertaken. A simple hard obturator was made to close the opening in the palate. This restored the power of speech perfectly. On the exterior I confined myself simply to restoring the missing nose, no attempt being made to alter the relations of the eyes and their lids. Incidentally, however, this defect was largely concealed, as will be shown later on. The first step in restoring the lost nose was to obtain an accurate impression of the face. This was done with plaster confined in a German silver cup, which I made specially for the purpose. The face was oiled and the eyes covered with wet tissue paper. The very small orifices remaining above the upper lip were plugged with cotton (as the cup did not cover the mouth) and the impression then taken. In this way an accurate cast was obtained which gave the facial outlines. I carved a nose out of wax which was shaped as accurately and smoothly as possible. A duplicate of this wax nose was then made in plaster and the plaster nose further carved and finished. This plaster nose was then mounted on a plaster backing and after the whole had been thoroughly dried a zinc die was made in the ordinary manner, by the use of moulding sand, and over this zinc die was poured a lead counter die, the object being to strike up a platinum shell which should be the exact shape of the plaster nose. Accordingly a pattern was made in the usual way and a piece of thin platinum—No. 33 standard guage—was carefully struck up. Openings for the nostrils were then cut out and these were made rather large to allow for the diminution in size which would be caused by the layer of porcelain. The only seam in the shell was in the septum between the nostrils, and this was soldered with pure gold. Two platinum tubes, each one-half inch long and the size and shape of the nostrils, were then made and fitted over the nostril openings where they were firmly soldered with pure gold. This was for the purpose of giving a natural tube-like appearance to the nostril.

This gave a platinum shell, which rested evenly and firmly on the face at every point and allowed free breathing. On this smooth platinum surface was now baked the porcelain manufactured by Close and used for Dr. Allen's "continuous gum work," the object being to produce a porcelain surface which should be a perfect match for the complexion. Of course "body" alone was too yellow, and "gum enamel" alone was too red, so various mixtures of the two were tried, but these were all unsucessful, owing to cracking in baking, and also the bluish tint of the platinum showing through and destroying the pinkish tinge of the enamel. Then the colour was nearly even, which, as will at once be seen, is unnatural. Finally, a thin coat of "body" was "biscuited" on, and over this was spread a very thin but uneven coat of enamel. This was fired till thoroughly fused, and after a few trials a colour was in this way produced which left little to be desired. I was now confronted by the beautiful glaze of the finished product which caused it to glisten in a highly unnatural manner. To overcome this the corundum wheel was used, but this, in removing the glaze, also took off a portion of the thin enamel coating, and thus changed the colour as well as the outline. Accordingly, with a sinking heart I took up my rivetting hammer and gently chipped off for about the tenth time all the porcelain and commenced on the platinum again. I fortunately again obtained a happy combination of "body" and "enamel," and this time, to remove the objectionable glaze, I used hydrofluoric acid (HF). This entirely destroyed the glassy appearance without in any way affecting the colour or shape.

For fastening the nose in position the old idea of spectacles was employed. A piece of quite heavy German silver wire was rolled flat and bent to fit accurately the curve of the upper half of the nose. Under this wire the porcelain was ground away so that the wire and platinum came in absolute contact. Care was taken to have the wire the exact thickness of the layer of porcelain. Holes were then drilled through the wire and platinum shell, and in these small rivets were afterwards inserted. This wire strip having been fitted to the nose and temporarily tied in position, the nose was placed upon the face and the spectacles in position and the bows of the spectacles were then fastened to the wire strip by sticky wax. The whole was then carefully removed. The wire strip, with spectacles attached, was then detached from the nose, spectacles and strip were then "invested" and silver solder substituted for the sticky wax. It now remained only to rivet the strip on to the nose and the device was finished.

The metallic rim of the spectacles falls just in front of the hollow under the eye, and so diverts attention from this defect as well as partially conceals it.

This is, so far as known, the first attempt ever made in America to restore lost features with porcelain, and though this material is rather unfamiliar to most dentists, and somewhat difficult of manipulation it seems to me most useful for such purposes and there exists no valid reason why the dentist with sufficient skill to construct an artistic plate, should not make use of this material in cases similar to the one I have just cited, and which are alas, no uncommon thing throughout the length and breadth of the land. The only piece of apparatus required which is not ordinarily found in a dentist's laboratory is a Parker Stoddard furnace. With this furnace and a good stock of patience and perseverance it is possible for the man of no more than ordinary mechanical and artistic ability to produce results equal to that which I have shown and described, and which elicited much favourable comment in medical and dental circles in Boston. Dr. Warren, in a lecture on surgery of the face in the Harvard Medical School cited this case as being a far greater success than any tedious operation of plastic surgery which could have been performed, and highly recommended that the mechanical restoration supersede the surgical one.

The Dental Review.

NECROSIS OF THE ALVEOLAR PROCESS.

By J. Henry Morgan, D.D.S.

The cause of necrosis of the alveoli is sometimes obscure, seeming in some cases, to be dependent on systemic influence though it can often be clearly traced to dental irritation, followed by inflammation and death of the periosteum, and it frequently results from an immoderate or protracted use of mercurial medicine, and may be induced by a chronic ulcerated condition of the gums.

There is also a character of necrosis attacking the alveoli that sometimes occurs as a sequence of the exanthemata, such as small-pox, measles or scarlet fever. It seems to occur mostly about the fifth or sixth year, just at a time when the jaw contains the whole of the temporary and the germs of the permanent set, more or less advanced. This affection presents itself within a few weeks after the disease has subsided—the gums becoming inflamed, swollen, tender, and separated from the teeth and alveoli, accompanied with a characteristic fœtor of the breath. It appears remarkably symmetrical, occurring almost at the same time on both sides of the jaw, denuding the bone and leading to necrosis and the exfoliation of a considerable portion of it. This usually includes the whole depth of the process and developing teeth.

The tendency to necrosis exists at all periods of life, but especially in early youth, when it is most destructive and less amenable to treatment. The origin of this disease is not yet clearly shown. The usual explanation that it occurs as a consequence of any cause that sufficiently impedes the circulation is true ; but it is not so easy to assign a reason leading to the inference that its origin is idiopathic. Inflammatory conditions do not always produce it, or there would be little hope of ever saving a tooth that had an abscess. Unquestionably systemic conditions favour it, and it will begin from infection, though some question this. There is no doubt that when necrosis is once established in a bone it will pursue its course regardless of any kind of treatment or surgical interference. It is checked by natural processes, though just in what manner has not been explained in a satisfactory way I believe the accepted opinion is that the periosteum or medullary membrane, as it may be, separates from the living bone and, becoming inflamed, a quantity of ossific deposit is thrown out, which is converted into new bone, forming a covering for the dead portion, by which it is enclosed or invaginated. Some advance the idea that eventually pathogenic germs will be found to be the cause of its origin. Should this be true, then its progress can be understood, and the reason shown why it is impossible to specify any period in its progress at which a sequestrum may be found separated from the living bone. One case that came under my observation commenced in the alveolus of an upper second molar ; it continued slowly forwards involving all of the process to the central incisor. where it stopped. Just why it should end here remains a mystery.

The conditions that usually give rise to necrosis of the alveoli, are teeth, or roots of teeth with alveolar abscess, improperly filled pulp canals, or roots that have been improperly crowded, violence done in extracting, ulcerated conditions of syphilitic origin ; then systemic conditions may be such as to favour the development of necrosis. I had charge of one case that was clearly the result of irritation due to an impacted lower wisdom tooth. The danger of extensive necrosis from abscessed teeth depends chiefly on two factors —the violence and duration of the inflammation and the heighth of temperature, and upon the physical condition of the patient.

The character of infection as a cause of necrosis of the alveoli is important, but we have not enough knowledge of this variety upon which to rest an opinion. The preceding inflammation is attributable to infection from the root canal, either not filled or improperly so, *as with cotton*, or from the blood in a chronic or imperfectly healed abscess ; however, in either case, the root canal or the tissue surrounding the apex of the root contains the exciting cause of the affection.

Now, in regard to the condition of the patient, in the majority of instances of necrosis from an alveolar abscess, or other cause, when it is extensive there is usually some constitutional taint, possibly temporary, and because of some systemic infection that would soon pass away under treatment but which now favours the process of suppuration. These conditions are not often under the control of the practitioner, and an opinion as to their influence is not always possible. In these instances we often see necrosis occurring in different parts of the body, apparently without a local cause. When such a condition is recognized it is bad practice to permit the inflammation to progress from an irritant that can be removed. A progressive necrosis always has a systemic cause.

In the treatment of these cases, so far as the portion of dead bone is concerned, the generally accepted opinion is that we shall wait for it to become separated from the living portion, for in attempting to remove it before then, there is always danger of destroying the new bone tissue being formed at the line of demarcation. When there is swelling and pus, the soft parts should be freely opened to give good drainage, and cleansed, as in this way the natural process is assisted. In a nercrotic condition of the alveoli, after making an incision in the gum to release the pus, antiseptic and soothing mouth-washes should be prescribed.

There is a difference of opinion among practitioners of equally good authority, as to whether in necrosis of the alveoli, the teeth or roots should be extracted, or wait for the separation of the sequestrum. Experience and observation seem to demonstrate that after a necrotic condition has once been established either by inflammation of the periosteum or ostitis, the teeth, *per se,* have no effect on the progress of the disease and are not to be considered in the treatment. Now, in my judgment, as the teeth can do no good by being allowed to remain, and unquestionably act as an irritant to the necrosed portion, they should be extracted, not with the idea of averting the disease. but simply to remove all that can possibly be an irritant, taking the precautions that a surgeon does in any operation on necrosed tissue. The use of an antiseptic before, during and after the operation should not be omitted. The question of retaining or extracting the teeth should be well considered, as very much depends upon the condition of the tooth or teeth, and whether the disease is confined to the alveoli or has involved the body of the bone.

Now, just at this point, care is essential in forming a diagnosis, as the first is usually not very extensive and seems to be self-limiting, while the other may include the whole maxilla. When the alveolar process is only implicated the teeth can be retained, though it is not always advisable, as after having lost their attachment, they necessarily become a source of irritation. If a tooth is to be extracted, it can make no difference whether it is done during the inflammatory stage preceding suppuration or later ; however, when extraction has been delayed until the suppurative stage is in full progress, and pus is being thrown out, the necessity for immediate extraction is not so urgent, and the operation may be postponed.

Though extraction should be the general rule, yet it should not be expected to avert an injury that has already been done.

Southern Dental Journal.

Reports of Societies.

MANCHESTER ODONTOLOGICAL SOCIETY.

The Inaugural Meeting of the Session 1894-5 of the Society was held at the Grand Hotel, Aytoun Street, Manchester, on Tuesday evening, the 2nd of October. Mr. W. Dougan, President, occupied the chair. There was a large attendance of members.

DEATH OF A MEMBER.

The PRESIDENT made an appropriate reference to the death of Mr. E. Williams, a member of the Society, practising for many years in Manchester. It was resolved that a letter of condolence be sent to the widow of the late member.

THE PRESIDENTIAL ADDRESS.

The President delivered his Inaugural Address, which is published on page 1030.

DISCUSSION AND VOTE OF THANKS.

Mr. MURPHY, in rising to propose a vote of thanks to Mr. Dougan for his address, said that though it was unusual to discuss the President's Address, yet, as they had the President's invitation, he would say something on the subject of the paper. For the last ten years he had taken a great interest in the comparative condition of the teeth, and he thought every dentist who had the interest of his patients at heart, desired that some light should be thrown upon this important matter. As the members of the Society knew, he himself believed that the quality of the water provided in our large towns was one of the factors to be considered. In regard to the conditions of factory life, it was no doubt true that our mills were better constructed, and better ventilated than formerly. The temperature in which much of the work was carried on—especially in the Bolton district—was, however, much higher than formerly, the heat of the rooms being often from 80 to 90 deg. when fine counts had to be spun, with the necessary presence also of a certain amount of moisture. The teeth of the work-people employed under these conditions were lamentably defective. They would not find any girl in a weaving shed, say over 17 years of age, with a decent set of teeth. This subject was one well worthy of the attention of members, and he hoped opportunity would be found for an adequate discussion.

Mr. Kelly seconded the vote of thanks, and observations were also made by Mr. Houghton and Mr. Renshaw. As there was no time to continue the discussion, it was agreed that the Council should be asked to provide a suitable opportunity to continue the debate.

The vote of thanks to the President was carried by acclamation and suitably responded to by him.

Exhibit of Dental Appliances by the Dental Manufacturing Co.

A fine display of Dental Instruments and Appliances was made by this Firm, including several of their new Dental Chairs, and on the motion of the President a cordial vote of thanks was accorded them, and acknowledged by Mr. Johnson, a representative of the firm present at the meeting.

LIVERPOOL DENTAL STUDENTS' SOCIETY.

The first ordinary General Meeting for the Winter Session was held on Friday, October 19th.

Mr. Nixon described a case of a lower abscessed incisor which had recently come under his care. He established a a fistulous opening at the apex of the root, through which he successfully treated the abscess.

Mr. Capon said he had been lately called out to a gentleman who had met with a bicyle accident. Besides superficial injuries, he had broken the left upper central short off with the gum, and very much loosened the right central. At the time Mr. Capon saw him, some hours after the accident, there was considerable inflammation around the teeth and a hard swelling in the palate. He took an impression at once with Mellotte's composition, and made a die and counter die of fusible metal. From this he struck up a splint of thin dental alloy, covering from the left lateral to the right canine inclusive, making the plate very small on the lingual side to avoid the palatal swelling. The splint was applied and held in position by plates and ligatures. The next day or two there was considerable oozing of pus from the sockets of both centrals, but the inflammation is now subsiding, and there is, he considers, a good prospect of saving both the root and the loosened tooth.

Mr Paul showed a sequestrum from a case of necrosis of the lower jaw. The patient was a girl from eight to nine years old. At the time she came under his notice in the Royal Infirmary, the necrosis was of three year's standing. It was probably a sequel to an attack of scarlet fever. The sequestrum was from the right side, and included the whole of the jaw from the condyle to the angle. The loss of bone being so extensive, the sequestrum was left in position for three months after loosening, to act as a splint for the bone of repair, and so prevent subsequent malposition. The recovery has been remarkably good. There is little or no extensive deformity, and she can open her mouth at least three-quarters of an inch. The teeth have not been injuriously affected, as the second permanent molar has since erupted.

The President (Mr. E. J. M. Phillips) then delivered a brief Inaugural Address. He thanked the members of the Society for re-electing him, and hoped he would be able to give them an equal amount of satisfaction in the next year. He was pleased to welcome both old members and new, and wished to remind the latter of the large scope for work afforded by the hospital, which he did not think was surpassed by any hospital in the kingdom. At the request of some of the older members of the Society, he was going to repeat a few brief remarks he had made before them on a previous occasion. Students commencing their hospital career have now an opportunity of not only cultivating professional skill, but of acquiring a good manner with their patients, with a view to private practice. Bad habits in this respect were much more easily formed than shaken off, and he could assure students that, important as the first qualification was, they would find few opportunities of displaying it, without the habitual excercise of the last and equally important. In conclusion, Mr. Phillips said that the Society was now well established and still improving, but that more energy was badly wanted among the student members.

The President then called upon Mr. Paul for his paper on "Nasmyth's Membrane," which is published on page 1021.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents]

A SUGGESTION.

To the Editor of the "British Journal of Dental Science."

Sir,—A person holding the proud position of Quack Doctor, who goes about villages for many miles round with his Quack Nostrums, drawing teeth as an attraction, has, within the past few weeks engaged the services of a tenth-rate Dental Assistant.

He then goes to London and buys Vulcanizer, Rubber, Teeth, etc. etc., returns and starts putting in artificial dentures for the million. Now, I consider that this is a thing to stop at once ; and the dentists have it in their own hands. I suggest that all the Dental Supply Companies are asked to give in their names so that they can be advertised that they will agree to supply only those persons whose names are on the Register, and no one else. Then allow the others, who will not so agree, to supply those Empirics and those alone, and I fancy they will soon find their occupation gone. But, at the present time, anyone can, I think, if they have the money, get supplied at the same price as the Dentists, and no questions asked. Doubtless there are many Dentists who can put the matter in a better form than I can, but it is the duty of one and all to try, both for their own interests and the public at large, to put an end to the matter at once and for all time.

May I, then, make a suggestion to deal only with those who will put on their notes, bills, etc.—" Only those on Register supplied with goods."

I remain,
Yours truly,
NEMESIS.

AN OLD PATIENT.

To the Editor of the "British Journal of Dental Science."

Sir,—Some time since, I sent you an account of my having extracted a tooth for a lady who was on the point of completing her 102nd year ; now I have something more to relate, which may be of interest to many of your readers. The same lady, a month since, called on me, with the request that I would make her an upper suction piece, which, I am glad to say, she is wearing with great comfort. She has still her inferior canine and bicuspids left, and still pretty firm in the mouth. I am keeping her model by me. as a curiosity, as I do not think it falls to the lot of many to take models at such an age. This lady completes her 103rd year in May, 1895, and she still attends church every Sunday, and to all appearance is likely to do so for some time to come : indeed, she herself says, she does not see why she should not live to 150 years.

Yours truly,
S. G. HUGO.

Nov. 3rd, 1894.

Dental News.

EXPLOSION OF OXYGEN.—Towards the close of a lantern demonstration given by Mr. Humphreys to some students at Birmingham, the bag containing the oxygen suddenly exploded with great violence. Two of the students received some injury but the lecturer fortunately escaped.

Dental Hospital Reports.

WORK done at the Dental Department of the Launceston Hospital during the month of April :—

Extractions	73
Fillings	7
Regulation Cases (children)	17
Operations under Chloroform	3
Miscellaneous Operations	34
Advice Cases and Prescribing	19
Total	153

To Correspondents.

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GENERAL PATHOLOGY AND SURGERY FOR DENTISTS.

By EDMUND W. ROUGHTON, M.D., B.S., (Lond.),
F.R.C.S. (Eng.)

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(*Continued from page* 1020.)

CYSTS.

A cyst is a closed sac with liquid or semi-solid contents. Cysts are usually divided into

1. Those formed by distension of pre-existing tubes or cavities.
2. Those of new formation.
3. Those of developmental origin.

DISTENSION CYSTS.

The most common are those that result from obstruction of a duct. Such as (*a*) *mucous cysts* which result from obstruction of the duct of a mucous gland. Such cysts are often seen on the lips, forming little semi-translucent swellings which contain a watery or glary fluid. They are treated by snipping off a portion of the cyst-wall with scissors. (*b*) *Sebaceous cysts*, which result from obstruction of the duct of a sebaceous gland by dirt, etc. They are most often met with on the scalp (wens) and face, forming tumours varying in size from a pea to a hen's egg. They are situated in the substance of the skin, which consequently cannot be pinched up over them. On the summit of the tumour a black speck may sometimes be seen, this is the orifice of the obstructed duct. They contain semi-solid sebaceous material. Sometimes the patency of the obstructed duct can be re-established, and the contents squeezed out : when this cannot be done the cyst should be removed. In some cases sebaceous cysts become inflamed and suppurate producing an abscess, which requires to be opened in the ordinary way. They often heal slowly.

Other distension cysts are the result of distension of a cavity which has no duct or outlet, *e.g.*, the tunica vaginalis of the testis, bursæ, etc.

CYST OF NEW FORMATION.

Under this head are included :—

(*a*) *Blood cysts.* These are most often met with in sarcomata the vessels of which are, as already stated, very thin and apt to burst. The extravasated blood becomes enclosed in a thin fibrous capsule. It may remain fluid for an indefinite period, or it may clot and liquify again, forming a kind of treacly fluid. In some myeloid sarcomata of bone, blood-cysts may form to such an extent that there is hardly any trace of the sarcoma tissue left. Blood-cysts may also result from extravasation of blood into a healthy tissue or organ, such as the brain (*cerebral hæmorrhage-apoplexy*) or into a serous cavity such as the tunica vaginalis (*hæmatocele* the blood becoming enclosed by inflammatory exudation.

(*b*) *Degeneration Cysts* may form in the interior of solid tumours, such as sarcomata, enchondromata, or soft fibroma, as the result of the cells of the tumour undergoing mucoid or colloid degeneration.

(*c*) *Serous Cysts* result from the distension and coalescence of lymphatic spaces in connective tissue; in this way the so-called adventitious bursæ are formed.

(*d*) *Parasitic cysts* result from the growth of some form, of parasite in a tissue. The best example is the hydatid cyst of the liver.

(*e*) *Implantation cysts* are caused by the accidental transplantation of portions of skin, surface epithelium or hair bulbs into the underlying connective tissue. They are most often found on the fingers of persons who gain their living by sewing, carpentering, shoe-making, etc. They are lined by skin and contain sebaceous matter and other skin products.

CYSTS OF DEVELOPMENTAL ORIGIN.

These are the result of some error or imperfection in the process of development. They may be divided into two chief classes.

(*a*) *Tubulo-dermoids.* In the fœtus there are certain canals and cavities which become obliterated at or before birth. In some cases the obliteration is imperfect, and the persistent portion becomes distended with fluid and forms a cyst.

(*b*) *Sequestration dermoids.* During embryonic life certain portions of the body covered with skin come in contact with one another and coalesce. During this process of coalescence it may happen that a piece of skin gets nipped between the two coalescing portions, and becomes buried beneath the surface; in its new situation it may continue to grow and form a cyst lined with skin, and containing hair, teeth, sebaceous material, etc. Sequestration dermoids are found only in those situations where coalescence takes place during embryonic life. Thus on the trunk they occur in the middle line of the body; on the face they occur at the angles of the orbit, along the naso-facial sulcus, near the angle of the mouth, in the middle line of the chin, and on the nose. They form small rounded or oval tumours situated beneath the skin (not in it like a sebaceous cyst); they may extend somewhat deeply, and when situated over one of the cranial bones, the latter may be indented, or even perforated, a fact to be borne in mind in dissecting them out.

DISEASES OF ARTERIES.

Calcareous Degeneration. This occurs in two forms (a) as a primary affection and (b) Secondary to atheroma. Primary calcareous degeneration occurs in old people, and affects vessels of medium size, especially the tibials and the arteries of the brain. The muscular fibres of the middle coat of the vessel, become infiltrated with salts, the result being that a number of rings are formed extending round the artery; after a time, the inner and outer coats become affected as well, so that the artery becomes converted into a rigid and brittle tube. The circulation through a calcareous artery may be so much impeded, as to lead to gangrene. Secondary calcareous degeneration will be described under Atheroma.

Atheroma. This is a condition which results from chronic arteritis. It is met with most frequently in the larger arteries, such as the aorta. The inflammation affects chiefly the deeper layers of the inner coat. It commences by an exudation of small round cells which form broad, flat, slightly raised patches of a whitish-yellow colour on the inner surface of the artery. After a longer or shorter time these cells, having an insufficient blood supply, undergo fatty degeneration and form a liquid mass which is still separated from the cavity of the vessel by the superficial layers of the inner coat. This condition is sometimes called an *atheromatous abscess.* Ultimately the abscess bursts and discharges its contents into the blood-vessel, leaving a rough surface sometimes called an *atheromatous ulcer*. In many instances the atheromatous abscess does not burst, but the more liquid part of the degen erate mass becomes absorbed, leaving only an irregular calcareous plate in the site of the original exudation. This secondary calcareous degeneration is readily distinguished by its irregularity from the regular circular arrangement of primary calcareous degeneration. The inflammatory process is not limited to the inner coat but extends also to the middle and outer coats, but here the inflammatory products being better supplied with blood, become converted into fibrous tissue, thus thickening and strengthening the artery at the spot weakened by the degeneration of the inner coat.

The most important causes of atheroma are chronic renal disease and hypertrophy of the heart causing increased blood pressure in the arteries. It is most often met with in men past middle life who have been addicted to alcohol and who have followed laborious occupations.

The chief results of atheroma are aneurysm, thrombosis, and embolism.

ANEURYSM. An aneurysm is a tumour containing blood and communicating with the cavity of an artery. It is usually the result of distension of a portion of the wall of an artery which has been weakened by atheroma. The sac of an aneurysm is formed by the coats of the artery together with the sheath and surrounding cellular tissue. An aneurysm is described as *fusiform* when it involves the whole circumference of the artery, as *sacculated* when it involves only a part, (say one side) of the arterial circumference, thus producing a projecting sac ; as *true* when all the arterial coats are distended and as *false* when some of them have given way. An aneurysm contains blood which is usually partly fluid and partly clotted. The clot may be of the ordinary gelatinous consistency, or may be laminated, i.e., deposited in layers. If left alone an aneurysm tends in most cases to go on increasing in size until it bursts either into some internal cavity or upon the surface of the body. In some cases the laminated clot increases in quantity until it fills up the aneurysm and affects a spontaneous cure. The tumour or swelling formed by an aneurysm presents the following characters in a typical case; it is in the line of an artery, it pulsates, the pulsation being synchronous with the action of the heart, expansile in character, and arrested by compression of the artery above the tumour ; by pressure the sac may be partially emptied and the size of the swelling reduced ; on listening with a stethoscope placed on the tumour a *bruit* is heard.

DISEASES OF VEINS.

VARIX. A vein is said to be varicose when it is more dilated than natural. Varix is most commonly the result of mechanical obstruction to the return of venous blood to the heart. Varicose veins are most common in the legs, lower part of rectum and anus (hæmorrhoids) and spermatic cord (varicocele). The affected veins become distended, and elongated, and consequently tortuous. Owing to the dilatation the valves cease to act. At first the walls of the vein become thickened to withstand the increased pressure, but later they get thinned in places, producing little bulging pouches. Varicose veins are very prone to become inflamed and thrombosed (*vide infra*).

PHLEBITIS is inflammation of a vein, and may be either *plastic* or *suppurative.*

Plastic phlebitis may be due to mechanical injuries, to extension of inflammation from neighbouring parts, or to the presence of a thrombus. The changes that take place in the inflamed vein are similar to those that occur in plastic inflammation of other parts, with this addition, viz., that phlebitis is nearly always associated with thrombosis either as cause or effect. The symptoms and treatment are identical with those of thrombosis to be presently described.

Suppurative phlebitis is most frequently seen in the veins of a bone which is the seat of septic inflammation. The septic organisms invade the clot which occludes the inflamed vein and cause it to soften and break down, so that it no longer forms an efficient barrier between the suppurating area and the fluid blood inside the healthy portion of the vessel. The result is that the phlebitis spreads along the vein. Moreover portions of the softened clot are apt to become detached and carried to distant parts producing metastatic abscesses (see Pyæmia). It may be inferred from the above account that the local symptoms of suppurative phlebitis are usually obscured by the septic affection of which it forms a part, whilst the constitutional symptoms are those of pyæmia. The treatment consists in endeavouring to render the part aseptic, and in preventing the infected clot from entering the general circulation. In some cases, e.g., septic thrombosis of the lateral sinus, this has been successfully done by placing a ligature on the vessel, between the inflamed portion and the heart.

THROMBOSIS is the clotting of blood inside a blood vessel. It occurs in arteries as well as in veins, but is much more common in the latter on account of their superficial position exposing them to injury, and on account of the relative slowness of the venous circulation. In considering the causes of thrombosis it must be borne in mind that the reason the blood does not clot inside the vessels of healthy persons is that the fibrin ferment (which is essential for the process of coagulation) is locked up within the white corpuscles ; any cause which by damaging the white corpuscles sets the ferment free, so that it can act on the fibrin-forming elements of the blood, produces thrombosis. These causes may be arranged under two heads, viz., (a) those in the blood, and (b) those in the wall of the vessel. The first includes (1) various constitutional affections, such as gout, rheumatism, anæmia typhoid fever, etc., (2) Foreign substances in the blood stream, such as pre-existing clot, an embolus, micro-organisms, a ligature transfixing a vein, etc., and (3) Slowing of the blood stream, whether due to local or general conditions. The second set of causes includes (4) Mechanical injury of the vessel wall, and (5) Roughening of the vessel wall from phlebitis or atheroma.

The clot which forms in the thrombosed vessel is called a thrombus. When the clot forms quickly the red corpuscles become entangled and give it the usual red colour ; when on the other hand the blood continues in rapid motion, and when the focus of coagulation is small, as in the case of a thread transfixing a vein, the leucocytes adhere to the rough surface, fibrin forms around them and a white thrombus is produced ; sometimes the thrombus is mottled, consisting partly of red and partly of white clot.

The following changes may occur in a thrombus in different cases.

1. *Contraction.* A clot in a vessel has the same tendency to contract, as a clot formed outside the body.

2. So-called *Organisation.* This means that the clot becomes infiltrated with leucocytes which develop into fibrous tissue.

3. *Calcification.* The clot becomes gradually converted into a calcareous mass called a phlebolith.

4. *Softening.* An aseptic clot may soften and form a greyish-red pulp which gets gradually washed away. Softening begins in the centre of the clot. A septic clot often undergoes yellow or puriform softening ; this is always the result of the action of bacteria and occurs in cases of suppurative phlebitis.

5. *Tunneling.* Occasionally the lumen of the vessel becomes restored by a narrow channel or tunnel being formed through the clot or between it and the vessel walls. The symptoms of thrombosis are the formation of a cord-like

swelling in the course of a vein, the skin over which is usually tender, reddened and œdematous. The parts normally drained by the blocked vein become congested and œdematous, unless there is a free collateral circulation. The treatment consists in keeping the part at rest, and allaying the concomitant inflammation by hot fomentations, or by smearing a mixture of belladonna and glycerine over the affected part.

Embolism is the plugging of a vessel by some foreign substance brought from a distance by the blood stream.

An embolus may consist of a vegetation from the valves of the heart, calcareous matter from an atheromatous artery, blood clot from a thrombosed vein, a portion of tumour which has invaded a vessel, a colony of bacteria, etc.

An embolus may lodge in any of the systemic arteries, the pulmonary artery or the portal vein. At the site of impaction a *secondary thrombus* usually forms around the embolus and completes the occlusion of the affected vessel. The parts supplied by the blocked artery become deprived of blood until collateral circulation is established. Embolism of the pulmonary artery may be at once fatal. When the embolus is derived from a septic source and contains bacteria it sets up inflammation and suppuration (see suppurative phlebitis and pyæmia).

(*To be continued*).

Stability of Solution of Hyd. Perchlor.—M. Burcker finds that a solution of bichloride of mercury in ordinary water is unstable if the solution be exposed to light or air. Decomposition occurs, and the solution gradually weakens. This is due to precipitation of the mercury by the ammonia and organic matters contained in the water and air. In the absence of light and air no change occurs, and if distilled water be used no decomposition occurs even if the solution be exposed to both light and air.

SUPPLYING ARTIFICIAL TEETH.*

By Frank Hampton Goffe, L.D.S. Eng.

Gentlemen,—You may often hear the older dentists lament the deterioration of mechanical dentistry since their time. Now, I maintain that although a great amount of bad work may be made, yet never in the history of dentistry has artificial work been brought to such perfection as at the present time. I want you all to remember this, though some consider it much more professional to fill a tooth and occupy their time in surgical work. Do not, therefore, devote all your energies to conservative dentistry, because good artificial work is still wanted now, and I do not care how clever you may become, an enormous number of teeth must eventually succumb, and artificial work will be required more and more as time goes on. It will be well, therefore, to go into practice equipped to meet this demand with intelligence, not as mere mechanics, but as artists skilled to the utmost in that department of your profession which will afford scope for the most enduring monument of your capabilities.

One of the saddest things to contemplate is that many dentists simply take the model and hand it over to the workshops (and very often to pupils) with the colour of the teeth, for a mechanic to make a set of teeth who has never seen the patient, and then dentists are surprised that the public complain of the artificial appearance of the work.

A good plan is to first learn the different characteristics of the various teeth, and then to get a piece of ivory and carve it up to the shape of the natural teeth in a perfect mouth. By this means you educate your hand to do fine work and your eye to the knowledge of what is of the greatest importance, the exact details of a perfect tooth.

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*Lecture delivered to the Dental Students at Mason College, Birmingham.

Having acquired the outlines, you must examine as many mouths as you can, and study the different sets of teeth, in order to understand the variations there are in the shape of the teeth and jaws. Dentists must be educated to understand that even when they put a set of teeth into a patient's mouth which are comfortable and good masticators, they have not fulfilled everything that is required of them. Although it may satisfy the owner it can be very unpleasant for his friends, because it may entirely alter his appearance.

The restoration of expression is one of the most important subjects that can occupy the mind of a dentist who is trying to raise the mechanical work to an art. To do this you must remember you have to restore the lost teeth, alveolar process, and the contour of the lips and face, and you must make your work harmonize with the general appearance of the patient. Study the face in full and in profile to judge really what you have to do ; before applying a remedy you must appreciate what is missing.

Having selected the size and colour of the teeth, you proceed to set them up, and here you can show the greatest taste and skill. It is astonishing what a difference can be made in the facial expression by the smallest alteration in the mounting of the teeth. You can have the centrals over-lapping, a lateral nicely filled, a tooth twisted, a vacant space left, the teeth may be cut to a square edge, and various other devices afford ample scope for artistic work. You must look at every case from the individual standpoint, and not put it through the workroom in a regular routine, as if your great object was to get the work out, and the money in as soon as possible.

You will find as soon as you start practice that you have many things to do that you never thought of while working in the laboratory. You have first to please yourself with the the work you do, then you have to make the patient comfortable and satisfy him as regards his expression, and you hope so to please the friends with the improved appearance that they may become patients themselves. You very often find while you are young practitioners that people complain of your work; you may feel perfectly satisfied that it would have given every satisfaction if made by your old master for one of his patients, and you fail to see anything wrong with it yourself. By far the better plan is to make another piece, although it may be galling for your feelings; yet never, if you can possibly help it, allow any one to leave you dissatisfied. It is the only plan if you wish to work up anything of a connection, and while I am speaking of this I may say that it is absolutely amazing to see the frightful pieces worn by people apparently well pleased with their dentures. We want to train dentists up so that these can be avoided, and to educate the people to refuse to wear anything so utterly wanting in skill.

Very often the less refined of your patients, even when quite elderly, will insist on having pearly-white teeth, placed in a perfect arch. This must strike the most casual observer as palpably artificial; still you must recollect that the patients have to pay for and wear the teeth, and you must to a certain extent bow to their wishes, trying, of course, to influence them to a better appreciation of what would be appropriate to their needs. When supplying a full set for an edentulous patient, the most difficult matter is to get the height of the teeth, as if you get them too high it gives them a lantern-jaw appearance, besides being very tiring. If, on the other hand, you get them too low, it is very apt to give them an aged look. It is better at first to err on the side of getting the bite too high, as you can always lower it afterwards.

Most men have to contend against becoming prejudiced in favour of one class of work and one type of tooth. In such a case,the whole of the work is reduced to a purely mechanical art, and a great amount of interest is taken out of their occupation, which becomes a dull routine, and at the best they can have but a limited success. Whereas if each piece is thought over in order to do the very best for the patient from all points, your work becomes a pleasure and each case a work of merit. The result is seen in the mouth, when the facial expression is restored and your artificial work fills its place naturally and harmoniously. It has been said on high authority that the end of all art is to please. Now most patients (especially the ladies, who form the majority) wish their appearance to be as favourable as possible, and therefore it becomes our duty to try and obtain this effect.

If the patient has any remaining teeth, of course the colour of the artificial ones must match. But if the mouth is edentulous, it is usual to say that fair people can have bright white teeth; if dark, you must supply yellowish teeth, and sallow patients have dull teeth.

As year by year education advances and the mental faculties become more and more developed, so the refinement of the face is more apparent. Of course there are faces of quite an ordinary, or even coarse, type ; but we have to study all faces, as these relate to our dental art.

Facial deformity may arise from various causes,but the most frequent is an ugly mouth caused by the malposition or unsightliness of the teeth, and with this class the dentist can so improve their appearance that it will do him the utmost credit. You have to decide whether to round the mouth by supplying artificial gum or to keep it flat by fitting the teeth directly on the gum. Very often you have to determine this by trying the wax plate in and judging the effect.

As to the length of the upper front teeth, the best guide is to let them come as low as the meeting of the lips when the face is in repose. This you have to vary somewhat by talking to the patient and seeing how they look when conversing or laughing. I have seen many very good pieces of work spoilt because after wearing them a short time they have "bitten up," and the teeth are never seen except in a fit of violent laughter. Some wish their teeth to show very little; others whose natural teeth were prominent think the new ones should be so. I can call to mind a lady for whom I did some work which I thought a great improvement to her, but she said her friends could not recognise her because her own teeth came over her lower lip. Finally, I made some to do so, and I thought them certainly not nearly so good, but it gave great satisfaction to her husband and relatives. This is of course one of the troubles you have to encounter. I have had people bring half a dozen photographs with them in order to be restored to their beauty of thirty years ago. I cannot give you any guidance in cases like these which I am pleased to think are the great exception. Usually patients put themselves entirely in our hands for us to do the best we can for them.

In paying attention to the appearance, you have to remember one of the uses of the teeth in the vocal articulation; therefore it is advisable to have the plates as small as possible and to arrange them so that they do not move about during speech, as this is most trying for the patient's companions You hear people's teeth sometimes "clacking" all the time they are eating, and see them wobbling about when they talk, and yet they assure you these are perfectly comfortable.

If you wish for perfect results you must not follow any fixed rule as the cases vary considerably, but observe and judge each case independently.

Now you may ask is there any reward for all this extra trouble which you expend upon a new set of teeth when some of the best financial successes are men who do not worry themselves about it. I cannot reply better than in the words of Epictetus.—“ Do you seek a reward greater than that of doing what is good and what is just ?”

ANOTHER TOOTH-PLATE ADVENTURE.

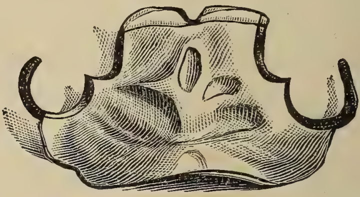
By Dr. A. Ledlie, Belfast.

In the number of this Journal issued on 2nd June, 1890, a detailed account is given by me, of the swallowing, by Mrs. F., of this city, of a toothplate with four artificial teeth, and a hook attached ; and of the voiding of it entire *per anum*, after an interval of three and a half days, without any ill consequence to its host. A brief account of the same case, also given by me, appeared about the same time, in the *British Medical Journal* ; and an admirable engraving of the little vagrant accompanied the letterpress in both Journals.

For the purpose of eliciting information as to whether any such case had previously been recorded, known, or heard of, I stated that it would be interesting to know if any reader of this Journal could point to a similar case, published or unpublished. As such artistic oral appliances belong only to recent times and to civilized society; as the case was brought directly and strikingly to the notice of more than 20,000 readers of the two Journals, and through them, indirectly, to the notice of many thousands more, professional and lay ; as more than four years have passed since the case was published; and as no one as hitherto attempted to produce a suitable companion; it may fairly be inferred that no such companion could be found, and that the case has stood alone, unmatched by any previous or contemporary occurrence.

But this is an age of progress and achievement. The word "impossibility" is losing caste, and may eventually become obsolete. Records are made, only to be broken; and the foregoing case, which until quite recently was permitted to bear the laurels unchallenged, is now in danger of being invited to take inferior rank and give place to another somewhat similar but, in some respects, even more marvellous case, which has also occurred in this city.

J. E. is a labourer in one of our city parks, married, aged 41 years. Three years ago he lost the two upper middle incisors. The same dentist who supplied Mrs. F's. famous plate, also furnished him with a vulcanite plate, carrying the two teeth requisite for filling the empty space, and having a strong pointed hook (see engraving) projecting laterally from each extremity, and adapted to embrace, not the adjacent lateral incisor, but the more distant canine, the better to secure the stability of the appliance while in position. Hence these formidable limbs stood out very prominently.



Early in September, 1894, while he was masticating a piece of dry radish, the crown of the left canine, which had long been carious, was broken off level with the alveolar process. This, of course, destroyed the left point of support and permitted the structure to swing pretty freely on the opposite hook, as on a hinge. Purposing to get the appliance altered to suit the altered circumstances, he allowed the left hook to remain attached. He kept the plate *in situ* both night and day, subsequent as well as prior to the breaking of the left canine.

On Saturday night, Sept. 29th, he retired to bed at 11.30. He had fallen asleep when, an hour afterwards, he was awakened by the plate just then in the act of passing into his throat. It lodged temporarily at the upper end of the œsophagus. He sat up in bed and, for some minutes, vainly endeavoured to cough it up again. He then went downstairs to the kitchen where, his wife estimates, he coughed up as much blood as would suffice to fill a teacup of average size. About five minutes after he entered the kitchen he felt the plate move down to his stomach.

Accompanied by his wife, he rang me up at 2 a.m., Sunday, September 30th. His demeanour showed that he was keenly sensible of the dangerous position in which he found himself, and out of which he saw no way of escape. He complained of great discomfort, like a crushing sensation, in the epigastrium. I produced Mrs. F's. renowned denture; read to him the narrative of that historic case, and very particularly directed his attention to my advice given to her regarding food—that it should mainly consist of "potatoes, rice, and eggs; that liquids should, as far as possible, be avoided; and that no purgatives should be taken." The information had a reassuring effect. Hope was inspired by the account of the satisfactory termination. He confessed that he had intended to take a cathartic, which he now believed would have proved disastrous.

He arrived home at 3 a.m. and swallowed a morsel of home-baked bread, made from wheaten flour. The epigastric discomfort immediately and permanently ceased. He believes that, till then, the plate had remained arrested at the lower end of the œsophagus, and that the bolus dislodged it and forced it down into the stomach. He again retired to bed and slept soundly till 7 a.m., when he breakfasted on dry bread and a boiled egg. He called on me at 1.30 p.m. He appeared composed, and asserted that he felt quite comfortable. He dined at 3 p.m. on potatoes and milk. He supped on potatoes, milk, and a boiled egg, and, according to his own account, slept well during the night. His wife, however, informs me that, on that and subsequent nights, he frequently became restless in sleep, and talked incoherently about the misadventure.

On Monday morning, October 1st, he breakfasted on potatoes, tea, bread, and a boiled egg ; and went to work in the park. He dined on potatoes, milk, and rice. His bowels were evacuated during the afternoon. He had supper of the usual kind about 7, and called on me at 8.30 p.m. when he said that he felt "all right."

On Tuesday he adopted the same bill-of-fare, and attended to his employment. During the afternoon he felt acute pain in the left inguinal region, but it was of short duration. He called on me at 8.30. and said that he felt comfortable. His bowels were evacuated afterwards on that night, and again on the following (Wednesday) morning, both evacuations being of loose consistence. His food and employ on that day were the same as on the previous day, and, according to his custom, he called upon me about 8.30 p.m., and informed me that he felt comfortable.

Thursday's history was a repetition of Wednesday's, as far as food and employment were concerned. On his way to my residence that night he felt some twinges in the hypogastrium, but on his arrival they had vanished.

On Friday morning, he breakfasted on firm oatmeal porridge. He worked in the park and dined as on previous days. After his return home, about 7 p.m., his bowels were moved. The evacuation was firm, and the voiding of it caused a cutting sensation in the anus. On examination it was found to contain the dental structure entire, and unaltered in shape! Half an hour later he visited me, and brought with him the dangerous little rambler, which he placed in my custody. He was, naturally, delighted by his marvellous deliverance. He asserted that he felt quite as well as he had done prior to the awkward misadventure.

The whole denture measures one and three quarters in. by one in., and weighs 42 grains. In the 1890 case, the dimensions were one and a quarter in. by seven-eights in., and the weight was 36 grains. These two rival, but unrivalled, adventurers, having served similar and highly useful purposes, and having accomplished similar and almost incredible achievements, are destined to occupy similar and closely located resting places, in a well-tended plot (in my private museum), preserved for the relics, and sacred to the memory of the renowned and the revered.

While comparing these two astounding cases, the reader can hardly fail to notice that, by a group of strange coincidences, there are many features and circumstances common to both : e.g., the same city—even the same end of it ; the sam dentist ; the same (upper) maxilla ; loss of support at the same (left) side ; the same neglect of removing the plate from the mouth before retiring to bed ; the same (or similar) swallowing of the plate while asleep ; the same (or similar) awaking while in the act of swallowing ; application at the same quarter for medical advice; the same treatment; and the same satisfactory result.

While contrasting these two rival cases and weighing their relative merits, it will be prudent to remember that, in this event, the contest for superiority lies between the sexes. The adjusting of the balance is, therefore, not only a delicate performance, but also a rather responsible undertaking.

J. E. himself would necessarily feel constrained to admit that the following items stand in favour of his fair rival:

1. *Courage.* She showed no symptoms of alarm, or even of apprehension of danger.

2. *Precision.* No deviation of her plate sufficient to shed blood, or to cause actual pain, occurred during the whole passage.

3. *Agility.* In her case the voyage from harbour to harbour was completed in about 3½ days, whereas in his case it occupied about 5¾ days.

On the other hand, it may safely be taken for granted that the lady herself would willingly allow that (1) his uninterrupted toil *versus* her opportunity for rest; (2) his comparatively coarse massive plate *versus* her comparatively smooth slender plate; and, most important of all, (3) his TWO widely separated hooks *versus* her ONE less projecting hook; are ingredients of high specific gravity, which compose a very ponderous counterpoise on the opposite scale. It rests with the reader to try the balance and to declare the result.

ROYAL COMMISSION CN TUBERCULOSIS.—The London *Gazette* announces that the Queen has been pleased to appoint Sir George Buchanan, Knight, M.D., F.R.C.P., Mr. George Thomas Brown, C.B., Mr. Joseph Frank Payne, F.R.C.P., and Mr. John Scott Burdon Sanderson, M.D., F.R.C.P., to be her Majesty's Commissioners to enquire and report what is the effect, if any, on human health of food derived from tuberculous animals; and, if prejudicial, what are the circumstances and conditions with regard to the tuberculosis in the animal which produce that effect upon man. Mr. Charles E L. Barton Hudson, F.R.C.S., is appointed secretary of this Commission.

British Journal of Dental Science.

LONDON, DECEMBER 1st, 1894.

DENTISTS AND ANÆSTHETICS.

Our readers will find, in another part of the Journal, reports of two cases where patients have died whilst under the influence of chloroform administered for tooth extraction. In the Liverpool case the lady had previously inhaled the same kind of anæsthetic upon several occasions, and the anæsthetist had been chloroformist to the Royal Infirmary for years. No operation had been performed when the circulation failed, so that the question of possible shock during incomplete anæsthesia does not enter into this case, as it has sometimes done in other like fatalities. In the other lamentable instance at Staleybridge we are told that the respiration failed first. Here also every care seems to have been taken. It was recognised that the patient was not in the best condition for taking an anæsthetic, but the dental operation was deemed urgent, and a wise precaution led to the patient being attended at her own home. Several teeth had already been removed when the fatal symptoms supervened.

The whole question of chloroform administration is, however, too large to be dealt with here, and, apart from recording these cases as we are accustomed to do, our interest is perhaps chiefly attracted by a remark which was made by one of the legal gentlemen attending the inquest at Staleybridge. He seems to be under the impression that some dentists obtain "a certificate" to enable them to administer anæsthetics. So far as we know, there is unfortunately nothing to prevent anyone assuming this responsibility except the fear of having to face a coroner's jury ; but the only justification for accepting the position of an administrator of chloroform, is, we think, the possession of a medical or surgical diploma. In regard to nitrous oxide the position is somewhat different. It is the dental anæsthetic, and a well-trained dentist in possession of his licentiate's diploma may be considered quite capable of undertaking its administration. We know nothing of any "certificate" other than this. But even under these circumstances, if a fatal result should occur, it would be well that the dentist should be able to show that he was not both administrator and operator, and that, in addition, he was fully competent to carry out all the recognised methods of resuscitation including the performing of a laryngotomy. This postulates a knowledge of dangerous symptoms, as well as the ability to select and apply the appropriate treatment.

Turning for a moment once more to the question of chloroform anæsthesia for dental operations, we unhesitatingly declare that this agent should only be employed in very exceptional cases. The patient should then be at home and in a recumbent position. Our authorities are very clear upon this point. Dr. DUDLEY BUXTON says "Chloroform should never be given to a patient sitting upright in a dental chair." Dr. FREDERIC Hewitt expresses himself thus: "When, from the condition of the patient, the A.C.E. mixture or chloroform is considered to be preferable to nitrous oxide or ether, the semi-recumbent or recumbent posture should be enforced. Such cases are, however extremely rare." We do not now refer to the advisability, or otherwise, of extracting a large number of teeth at one time, but most will agree that the difficulty of the operation is not lessened by the recumbent position, for unless the head hang over the edge of the table as recommended by Mr. BRUNTON, of Leeds, there is greater danger of foreign bodies entering the larynx, to say nothing of the greater trouble of dealing with hæmorrhage in a prolonged operation.

Dental Treatment for Pauper Children.—This question seems to be receiving attention by Government authorities. Amongst the returns required by a Local Government Board Inspector from the Superintendent of a Metropolitan District School is a statement as to what provision is made for ophthalmic and dental treatment. It will, we hope, soon be thoroughly recognised that, as regards conservative dentistry, it is impossible to expect the medical officer to undertake the charge of the children's teeth. The battle of the tooth brushes still seems to be kept up. Mr. Crocker who has been recently appointed by the Southampton Board of Guardians, requested that the children in the workhouse should be provided with toothbrushes. A resolution to this effect was proposed and seconded at the last meeting of the Board, but the motion was referred to a Committee.

Suppuration without Putrefaction.—Not long ago the question was raised, incidentally, at the Odontological Society, as to how one could tell whether a root canal was really aseptic. Of course it can be tested to some extent by closing the canal, but for the purpose of finding out whether it is safe at the time to introduce a permanent filling most dentists rely upon their sense of smell. When the well-known odour of a putrefying pulp is no longer present it is considered that the peri-apical tissue and, practically, the canal are aseptic. And yet it seems that we should not be too sure, for as Mr. Watson Cheyne recently pointed out, in an address on Wound Treatment, suppuration may occur without the pus having a putrefactive odour. In fact it is now known that some pyogenic organisms do not produce any putrefactive change, and "the test of asepsis in a wound is not only absence of smell, but absence of every trace of suppuration." The action of the tissues themselves in destroying bacteria, must not be overlooked. Lister has referred to cases of harelip and cleft palate, which healed without suppuration, although organisms gained entrance to the wound in large numbers, as showing the great resisting power of the tissues.

DENTAL APPOINTMENT BOOK.—Messrs. Bale & Son have issued another edition of the appointment book for dentists which met with such favour last year. Two or three minor changes have been made in the arrangement of the necessary matter, but we are glad to find the main idea is unaltered. There is now a small chart of tooth diagrams at at the head of each day's space to which reference can be made, and upon which some indication of the operation can be shown. Besides the usual Calendar information at the commencement, there are lists of members of dental Societies, and Hospital Surgeons, which are useful for reference ; there is also a page of receipts for mouth washes, &c.

ODONTOLOGIAL SOCIETY OF GREAT BRITAIN.—The next Meeting of the above Society will take place on Monday, 3rd inst, at 8 o'clock, when a paper will be read by Dr. Job Collins, on "Orbito-Maxillary Diseases." The following Casual Communications will be brought forward by Mr. Stephen Mundell, on "The special advantages of Dr. Flagg's Contour and Submarine Amalgams." Mr. C. Robbins, "A Case of reunited Fracture of the Maxilla." Mr. A. R. Colyer, "A Case of a Temporary Molar retarding the Eruption of the First Permanent Molar."

Messrs. Barrauds, of Oxford Street, are engaged upon a picture of the members of the Society, which we hear promises to be very successful.

NAPOLEON AND ORAL HYGIENE.—The *Blackburn Daily Telegraph* draws the attention of the Sheffield Guardian who had "never bought a tooth brush in his life," to an extract from a book which has just been issued about the Great Napoleon. "Having washed his face and hands, he picked his teeth very carefully with a boxwood toothpick, and then brushed them for some time with a brush dipped in opiate; went over them again with fine tooth powder, and rinsed his mouth with a mixture of brandy and fresh water. Lastly, he scraped his tongue with a scraper of silver, of silver gilt, or of tortoiseshell."

CARDIAC SYNCOPE UNDER CHLOROFORM.—Mr. Robert Ballard sends to *The Lancet* an interesting account of recovery from cardiac syncope. The patient was a lad of fifteen years, and was put under the influence of chloroform for the removal of some necrosed bone in the leg. Anæsthesia was complete in from eight to ten minutes, and the only symptom which had caused any anxiety was a marked pulsation of the superficial veins of the neck. After about ten minutes of anæsthesia the pulse suddenly became imperceptible; he took three or four deep inspirations and the breathing ceased. The patient's head was at once brought over the edge of the table and artificial respiration commenced. Hot water was poured over the chest, the tongue was drawn forwards, and nitrite of amyl on lint was placed over the nose and mouth. The effect of this was almost instantaneous; the heart began to flutter feebly, and then to palpitate violently, the extreme pallor disappeared, the pupils contracted, respiration recommenced, and the patient was soon out of danger. The symptoms were regarded as due to temporary mitral regurgitation and engorgement of the right side of the heart which the nitrite of amyl seems to have relieved.

RESECTION OF THE INFERIOR DENTAL NERVE.—At the recent Congress of French Surgeons, Dr. Rafin narrated a case of neuralgia in a man aged fifty-two. Forty years before, the patient had received a wound over the right mental foramen, and five years before coming under treatment neuralgic pains commenced at that spot, but gradually the rest of the face on that side became affected. Medicines having failed to give relief, the frontal, infra-orbital, and inferior dental nerves were divided. This operation was followed by complete anæsthesia, but three months later the pain returned in the lower jaw. The inferior dental was then removed as far back as the masseter muscle, and the central end stretched. At the time the case was reported, eight months after the operation, the patient remained free from pain.

"PAY WARDS" AT HOSPITALS.—The resolve of the authorities at the Great Northern Central Hospital to admit patients who can afford to pay something appears to have given much dissatisfaction to the medical practitioners of the district. The Hospital staff stipulated that no patients should be so admitted without the written consent of their own medical attendants, and that the members of the staff should have some control of the admission of such patients. These suggestions do not, however, meet with the approval of the general practitioners, and there are already threats of boycotting any member of the Staff who gives his services gratuitously in the "pay wards." This means that these surgeons will not be called in consultation by the aggrieved medical men.

THE INTESTINAL TRANSIT OF A TOOTH-PLATE.—The interesting cases published in the JOURNAL by Dr. A. Ledlie, should serve as an illustration of the danger of patients retaining their artificial dentures in the mouth at night-time. Especially when they are not intact, but loose, the proper place for them is a vessel containing some antiseptic solution. It is not always the case that when a denture has once passed successfully down the gullet, and entered the stomach, that a sentimental journey along thirty feet of intestine, is completed with that freedom from serious discomfort which Dr. Ledlie is able to record of his patients. The treatment adopted seems to have been a common-sense one and very satisfactory. Can any of our readers challenge the claim that this last case is a "record" for size and clasps?

DENTISTS AND THE PUBLIC.—The *Pall Mall Gazette* of the 22nd ult. contains a leading article upon this subject. It gives a historical account of the legislation up to date, and generally attempts to educate the public how to diagnose the *bona fide* dentist. The defects of the Dentists' Act are discussed, and American Dentistry and Advertising Dentists both receive attention. Remembering what happened when a similar onslaught was made not long ago in a weekly newspaper, we shall be prepared to find that some of the different parties attacked will rush into the fray, appealing to the Editor's fair-play, and thus securing a good opportunity for advertisement, whilst encountering their foe and bringing counter-charges. For our part, we rest content by pointing out that one of the concluding statements in the article is not, in our opinion, quite accurate. The General Medical Council has not definitely decided that "certain forms of advertisements were objectionable, and constituted in the terms of the Dentists' Act, " infamous or disgraceful conduct in a professional respect" thereby rendering a registered dentist liable to be struck off the register." The General Medical Council thought some advertisements might easily become "infamous," but they have not committed themselves to take any punitive action in the matter. The article also states at the end that "It cannot be too frequently reiterated that the man who advertises thereby stamps himself as unqualified." We are not in favour of dentists advertising themselves, but the above statement is untrue. Some of those who do advertise are qualified, holding the L.D.S. diploma.

The Glasgow Dental Students' Society.—The first meeting of the Session was opened on November 7th. by an address from the Hon. President, Mr. J. R. Brownlie, who after a few words of thanks to the students for electing him, and congratulating them on the success of their Society, read an interesting paper on Children's Teeth, and the fillings to be employed in treating them. In conclusion he urged upon the students the necessity of gaining the confidence of their young patients. We have received a list of papers promised for the ensuing year, and are pleased to find there is every prospect of the Society having excellent opportunities for successful meetings and discussions.

ENAMEL MARGINS.

By Dr. R. D. Crutcher, of Lewisburg.

Cavities should be well finished at the edges to avoid fracture of the enamel. Labial cavities are very difficult, especially when extending under the gum-margin. The gum will sometimes need to be split to give access to the deep margin. Labial cavities are more difficult on the inferior than on the superior teeth. On the grinding-face, when caries occurs in separate pits and fissures they should be run together, removing all soft enamel, leaving no overhanging edges to break off subsequently. In approximal cavities, the undermined margins should be cut away and the edges of the cavity well polished. In the bicuspids and molars, the cervical border of approximal cavities should be made U-shaped and not flat, except of course in cases where the decay extends outward on either side.

The Dental Cosmos

Abstracts of British & Foreign Journals.

ELECTROZONE.

By C. F. W. Bödecker, D.D.S., M.D.S., New York City.

Since all purulent inflammatory processes depend upon an infection of the inflamed tissue with staphylococci and streptococci, it is evident that, by the early application of a proper antiseptic agent, we may prevent the formation of an abscess. Most of the antiseptics, however, which will destroy micro-organisms, are powerful irritants, and will, therefore, disintegrate the tissues to which they are appplied, in consequence of which their employment is not always advisable. In dental practice, our principal aim should be to prevent infection with micro-organisms, although in the mouth this is possible only by exercising great care. The oral cavity always contains innumerable bacteria, although the majority of them are inert so long as they remain on the surface of a tissue covered by healthy epithileum. If a single one of these micro-organisms obtains entrance into the depth of the tissue, which, at the time, is in the stage of non-purulent inflammation, an abscess is the result. Such infections easily occur after wounding the mucous membrane of the mouth, as well as in consequence of gangrene of the pulp. In both instances, however, by the timely employment of proper antiseptics, we may be able to prevent a purulent inflammation, although it is a fact that most of the antiseptics in common use are ineffective in accomplishing this result. The writer has, however, lately made use of a new preparation called "Electrozone," which, so far as his experience reaches, has given uniformly satisfactory results. This fluid, which is nothing but sea or salt water that has been subjected to an electrolytic current, is an admirable antiseptic. It is a clear liquid, neutral in reaction, smelling somewhat of free chlorine, and has a rather disagreeable, salty taste. It is the discovery of A. E. Woolf, who has been successful in sterilizing polluted water with it on a large scale.

The writer's method is as follows: In a case of purulent pulpitis, partial or total gangrene of the pulp, the diagnosis of which should be fully clear, the pulp chamber should be opened freely, which usually will instantly relieve the pain. The pulp chamber of the tooth should then be syringed out with tepid water, to which has been added some electrozone. A small piece of cotton, saturated with pure electrozone, is then introduced into the pulp chamber, followed by one or two larger pledgets, also moistened with electrozone. The patient is then directed to renew only the last piece of cotton, from three to five times daily, or at least after every meal, using the precaution to rinse the mouth with a weak solution of electrozone (about a teaspoonful to a tumbler of water) previous to the removal of the cotton. Every pledget of cotton, previous to its introduction, should be moistened with pure electrozone, and packed as tight in the cavity of the tooth as possible. When the tooth has been treated in this manner for two or three days, the pulp canal may be cleaned out and filled at once, without any fear of future pericementitis, provided that an infection of the pericementum has not already occurred.

To clean out and fill a pulp canal successfully, the rubber dam should be applied, and when in position be moistened with pure electrozone. The hands should then be thoroughly washed again and also disinfected with the same agent. All the instruments to be used should be immersed in pure electrozone. The tooth to be treated is carefully cleaned with a piece of cotton moistened in the same antiseptic, after which the cotton may be removed from the pulp chamber of the tooth. If little of the pulp is found to be alive, this may be extirpated at once, without much pain, by means of a fine nerve drill, rapidly revolving in the hand-piece of the dental engine. Previous to the introduction of any instrument into the pulp canal, the latter should be flooded with pure electrozone, and no air should be allowed to enter the pulp canal after the extirpation of the pulp, until it has been thoroughly disinfected. The canal may then at once be filled with safety and if the filling material has been made sterile and is not pushed through the apical foramen of the root, the tooth will give no further trouble.

As a mouth-wash, the writer has made use of the antiseptic with gratifying results, although, on account of its disagreeable taste, it is objectionable to some patients. If, however, it is diluted with water, ten to twenty volumes, its taste is not so obnoxious, and in such dilutions Dr. E. A. Martin pronounces it still the most powerful antiseptic known. The writer has made use of it in such diluted form in the treatment of empyema of the antrum, necrosis of the jaw bones, alveolar cysts, and pyorrhœa alveolaris, with similar good results.

The Dental Practitioner.

PORCELAIN WORK.

By J. H. Downie, D.D.S., Detroit, Michigan.

The working of porcelain, in form in continuous gum plates, has been known to the profession for a great many years, although it has never come into general use. The working of it by the dentist, however, in the form of crowns, bridges and inlays, is of quite recent date. There is no class of work which interests the profession more at the present day and it is, without doubt, the coming work in dentistry. The manner in which it has been received. and the grand success which numbers have had with it, are good evidences of this. To be sure, some have failed to make a success of it, and have already thrown it aside ; but their lack of knowledge of how, properly, to do the work, in no way condemns it. The days when glaring gold is admired will soon cease to be, and the truly artistic operator will endeavour to imitate nature, and replace the lost organs and portions of them with a substance which matches so nearly in colour that it can scarcely be detected.

Porcelain crown-work has been practised for quite a number of years, and, when properly done, is one of the most satisfactory operations in dentistry, to both the patient and the operator.

A crown fused to a metallic cap, previously fitted to the root, and backed up with porcelain is that with which we have to deal in this paper. With it we get a perfect adaptation to the root by means of the platinum cap, which prevents the splitting of the roots, prevents the joints from decay, and the washing out of the cement, and strengthens the attachment of the crown. The anterior portion of the band is covered with porcelain of the same colour as the facing, so there is no metal showing, and no necessity for cutting off the root far above the gingival margin, and lacerating the gums. It is made with the teeth used for other work, so that no special tooth is required. The backing is fused on to the facing, making a perfect union, so it is not necessary to protect the point with metal, to prevent the racing being broken off. The facing of a Richmond crown being always sure to break off, if not protected at the point with the metal backing, is no reason to suppose that a solid porcelain crown is not sufficiently strong. In the case of the metal-backed crown there is no unicn between the backing and the facing, the porcelain front being held in position by the two small pins alone, which certainly makes a very weak attachment. By the porcelain process, the backing is fused on to the facing forming a perfect union, which makes, in the finished case, a solid porcelain crown.

The Logan crown, which has served so good a purpose in the past, is sufficient evidence of the strength of a solid porcelain crown. It cannot be truthfully said of it, that the porcelain is not sufficiently strong, as we have very rarely seen one broken. The porcelain is not the weak point in the Logan crown ; the difficulties with it are, getting the proper adaptation. liability of the post to break and the root to split. These may be, in a measure, overcome by banding, but in doing this we present to view a strip of gold across the base of the crown, which at once puts upon it the artificial stamp.

The numerous ways in which the baking of the crown may be modified to fit the special case, and the means which we have at hand for its construction, are great advantages in the porcelain process. A crown may be made from almost any plain tooth for either metal or rubber work, or from almost any tooth crown manufactured. The preferable tooth for this kind of work is the flat back tooth, such as is used for bridge work. The root should be ground off flush with the gums, the tissues being pressed away to allow of its being dressed down as far as possible without lacerating them. As the root enlarges at this point, leaving when ground off, an overhanging edge, it is necessary to dress it off round its circumference in order to properly fit a cap to it. This can best be done with metallic disks and sharp scalers. The measurement of the root is taken with a small wire, using a small dentimeter to handle it. The wire, when removed, should be cut on the opposite side from the twist and straightened out. Laying this on a piece of platinum (30 gauge), a mark is made to show the exact length. The band is cut a little longer than marked, which allows, when the ends are bevelled, for the making of a lap joint.

The soldering, as in all cases of porcelain work, is done with pure gold. The band is fitted to the root, and a cap soldered over the top, the cap being perforated to correspond with the root canal. The post may be made from almost any kind of platinum wire, but the most suitable material is square iridio-platinum. The end of the wire is flattened with a hammer, a little broader than the space between the pins of the tooth, and a notch filed in each side so that it may be placed between the pins which are then bent over it. This holds it sufficiently firm without soldering. The tooth or facing with post attached may now be set on in position, and waxed in place on the cap, after which it is removed and the cap filled with an investment of equal parts of pulverized silex and plaster. This when set holds the cap in position to the post, after the wax has been boiled out. The case is now ready for the adding of the porcelain. This material is mixed to a paste with water, and applied with a sable brush. It is built around the anterior portion of the band, and well out on the cap, but not over the pins of the tooth. After the first fusing these pins are filed or ground away, and in the case of a very close bite the facing may be ground away at the point of contact. More body is now added, to give the crown the desired contour, which, when fused, completes the case.

Porcelain bridge-work has much to commend it to the profession. It has no joints to absorb the secretions, and certainly merits the name of sanitary bridge-work. The unsightly gold may be dispensed with in all cases except where it is necessary to make an attachment to a gold cap, and with this exception the natural appearance can be almost perfectly restored. No gold cusps or cutting edges are required to protect the bridge teeth, for precisely the same reason that they are not needed in the crown work. The crown already described is used as a support for these bridges, the only difference in its construction being that when intended for bridge-work, after setting it up in wax, it is invested, and the cap and pin soldered. This allows the crown to be set in position without the porcelain backing, and an impression to be taken with modelling compound. A model is run, the bridge teeth are waxed in, and the case invested. After removing the wax, a bar of iridio-platinum is fitted from the posts of the supporting teeth across under the pins of the bridge teeth and soldered in position. The case may then be removed from the investment, and the porcelain packing added and fused on. When it is necessary to use a gold cap for the support of a bridge, it is made of an alloy of gold and platina (22 k. gold). This admits of being soldered with pure gold, is quite hard, so that its wearing qualities are excellent, and goes through the heat of the furnace without oxidation. The bar is soldered to the cap, the porcelain added and fused, and the case handled in every respect as when porcelain crowns are used for supports.

Porcelain inlaying is a grand thing in certain cases, and it is much to be regretted that the present existing circumstances do not warrant its being used more extensively. The difficulty with inlaying, is that we have not a suitable cement for setting. There is no doubt that sooner or later we will have a cement suitable for this purpose, which will make this the ideal filling. The best method we know for making them is to burnish platinum foil over and into the cavity, thus forming a matrix into which the porcelain is built and fused. Body may be added and fused two or three times until the required contour is obtained. The platinum is then peeled off, and retaining points or grooves cut into the porcelain with the edges of a diamond disk, also undercuts made in the cavity, when the piece is ready for cementing in. The mistake is often made of taking too small a piece of foil with which to make the matrix. This should be large enough to hold easily in position with the thumb and finger of the left hand, while it is being burnished into the cavity with the right. This overlapping foil, by which the matrix is handled, is left on during the process of baking. There are two principal points wherein lie the secret of having a good fit with an inlay: First, in making the walls of the cavity bevelled outward for a little way from the margin, so that when the platinum is removed, the plug will fit tightly on the margin as it bevels out, and will set in the thickness of the platinum removed, thus taking up the space occupied by it and making a perfect fit at the margin. Second, in only partially filling the matrix with body, the first time it is baked, then replacing in the cavity and burnishing down the edge again, this corrects any springing of the matrix. For labial cavities, where there is no force to be exerted which will tend to loosen the filling, they may be used with Hill's Stopping, using a warm instrument handle to dress them into place. This is, perhaps, more reliable as to lasting qualities than any cement which we have at the present day.

The Jacket crown, which is a platinum cap with a porcelain facing, is in certain cases very valuable. Its use is indicated for undeveloped teeth, usually called rice or peg teeth. These may be built out, and the normal appearance fully obtained. It is also of use for decayed teeth where the pulp has receded considerably and is in a healthy condition. It is of no use for decayed teeth of normal size, if the nerve has not receded, and they set in their proper position in the arch ; because they must be ground so near to the pulp in order to get the facing on without its being too prominent, that the death of that organ is almost sure to result. There is no reason why they should ever be used in any case where the pulp is not alive.

To construct this crown : Make a deep band or ferrule of platinum to fit the tooth which has previously been ground, slightly tapering on its sides and lingual surface, and flat and receding considerably on the labial surface. The inner portion of the band, which stands up from the tooth is slipped off, and a flat piece soldered on to make the sloping lingual surface (supposing the crown to be an incisor or cuspid) and the anterior portion of the band ground very thin, except around the gum margin, this thin anterior portion is malleted down against the tooth, using a large foot plugger, and folding down the upper corners when necessary. A tooth is selected, either a flat back, or a plain tooth for rubber-work. It is ground away flat at the back, tapering down to as thin an edge as possible at the base. After grinding until it will set in the proper position, the cap is removed and the facing stuck on with a little porcelain body. The piece is then set on a tray, in which is a little ground silex to keep it from shifting around while in the furnace. It should be very carefully heated up in order that the facing may not be thrown off. When cool, more porcelain is added around the edges to securely attach the facing, and after fusing, the crown is ready to be cemented in place. All these operations in porcelain are made infinitely more practical by the use of the low fusing porcelain body, which enables us to back up a tooth without etching its face, to fuse on to a bridge which is soldered to a gold cap, and to match the colours almost perfectly.

The Dental Register.

Dental News.

GENERAL MEDICAL COUNCIL.

Tuesday, November 27th.

The General Medical Council met to-day at the commencement of the winter session.

The PRESIDENT, Sir Richard Quain, Bart., in the course of his opening address stated that the Education Committee had prepared and would submit to the Council a very complete Report on the Codification of the existing Regulations of the Council applicable to Dental Qualifications. Other matters of dental business including the duty of authorising a Representative of the Council to attend and be present at the Examations conducted by the Bodies granting Qualifications in Dentistry, would come before the Council in due course.

Wednesday, November 28th.

SIR RICHARD QUAIN, Bart., President, in the chair.

CODIFICATION OF REGULATIONS ATTENABLE TO DENTAL QUALIFICATION.

Dr. BATTY TUKE, chairman of the Education Committee brought up a Draft Report on the existing Regulations of the Council applicable to Dental Qualifications. He said last year the Committee having to consider the various regulations as to the General curriculum found considerable difficulty in picking them out of the various volumes, and therefore asked to be intrusted to codify the existing Regulations applicable to Dental Qualification. That had now been done without the slightest change in phraseology. They had simply brought together the various Regulations of the Council withl reference to this matter. During the course of the Examination of these various Resolutions, two facts came to light, viz., that the Regulations of the Royal College of Surgeons of Edinburgh, and the Faculty of Physicians and Surgeons of Glasgow were not in accordance with the Regulations of the Council, inasmuch as they only asked six months attendance in the practice of Surgery instead of twelve months. The Committee therefore thought it right to recommend that the attention of these two Bodies should be directed to this question. The Committee recommended (1) " That the attention of the Royal College of Surgeons of Edinburgh be called to their Regulation requiring the attendance on the practice of Surgery, and Clinical Lectures on Surgery, at a recognised Hospital . . . six months." (2) That the attention of the Faculty of Physicians and Surgeons of Glasgow be called to their Regulations requiring attendance on " the practice of a recognised Surgical Hospital, with Clinical Instruction, not less than six months." He moved the adoption of the proposition.

Dr. MCALISTER seconded.

Sir William Turner suggested that this in itself was hardly sufficient. The attention of the Bodies should be called to the way in which their practice differed from the recommendation of the Council.

Dr. Cameron said the suggestion was a very important one. He believed that the reason the Faculty only required six months was that they were absolutely unaware that the Council required twelve months. He believed he was quite entitled to say that the Bodies would at once alter their practice. They had no object to serve in making it six months, it simply was that they did not know that the Council required twelve.

Dr. McAlister thought it would be enough to send a copy of the Regulations.

Sir Walter Foster said they should be asked to bring their Regulations into conformity with the Regulations of the Council.

Dr. McAlister doubted if any member of the Council had been aware that twelve months hospital practice was required from every dental student. The Regulations had been scattered through various volumes, and it was only now discovered what was required. It was not wonderful therefore that certain Bodies had not noticed it, and had adopted what they themselves considered sufficient.

Dr. Cameron said he believed the Faculty never had been informed of the fact that the Council required twelve months.

Dr. McAlister said if the Regulations were codified and sent to all the Bodies, they could either comply with them, or give good reasons for not complying. It seemed rather premature to do much more than call attention to the fact, and to send a copy of the Regulations.

Dr. Heron Watson said there was a great want of knowledge throughout the country with reference to the recommendations and regulations of the Council. He thought it should be part of the duty of the office to submit to each of the Bodies those requirements, so soon as they were determined upon.

Dr. Batty Tuke said the recommendation would speak for itself. If a copy was sent that would be sufficient.

The motion was then put for the adoption of the Report, with the addition of the recommendation, that these Bodies be requested to bring their Regulations into harmony with the Recommendation of the Council. This was agreed to.

DRAFT REPORT.

By the Education-Committee on the Existing Regulations of the General Medical Council applicable to Dental Qualifications.

Members:—Dr. Tuke, Chairman. Sir John Banks, K.C.B., Dr. Bruce, Dr. Fraser, Dr. Glover, Rev. Dr. Haughton, Dr. Kidd, Dr. Macalister, Sir John Simon, K.C.B., Mr. Wheelhouse.

The Committee have to report under the following Reference by the General Council, of date May 26, 1894:—

"Dr. Tuke, on behalf of the Education-Committee, asked that the Committee might be instructed to codify the existing Regulations of the Council applicable to Dental Qualifications, and to report thereon to the Council. To this the Council assented."—(*Minutes*, Vol. XXXI, p. 98.)

The Education—Committee have accordingly codified the existing *Resolutions* of the Council in respect to Dental Education in the following form.

(I) Regulations of the General Medical Council in regard to Preliminary Education.

(*a*) The Registration of Dental Students shall be carried on at the Medical Council Office in London, or at the Branch Council Office in Edinburgh or in Dublin, in the same manner as the existing Registration of Medical Students, and subject to the same regulations as regards Preliminary Examinations.

(*b*) Students who commenced their professional education by apprenticeship to Dentists entitled to be registered, or by attendance upon professional lectures, before July 22, 1878 (when Dental Education became compulsory), shall not be required to produce evidence of having passed a Preliminary Examination.

(II.) Regulations of the General Medical Council in regard to Professional Education.

(*a*) Candidates for a Diploma in Dental Surgery shall produce certificates (i) of having passed a Preliminary Examination in General Education ; (ii) of being twenty-one years of age : and (iii) of having been engaged during four years in Professional Studies.

(*b*) Candidates shall produce certificates of having passed through the following curriculum :—

(1) GENERAL MEDICAL SUBJECTS.

Anatomy, one Winter Session.

Anatomy of Head and Neck, one course of not less than twenty lectures, or a second course of Anatomy.

Dissections, nine months.

Physiology, Chemistry, Surgery, Medicine,	one course of six months.

Materia Medica, Practical Chemistry,	one course.

Attendance at a recognized general hospital with Clinical Instruction, not less than one year.

(2) SPECIAL SUBJECTS.

Dental Anatomy and Physiology,
human and comparative, not less than twenty-four lectures.
Dental Surgery, not less than twenty lectures.
Metallurgy, not less than twelve lectures.
Mechanical Dentistry, not less than twelve lectures.
Practice at a Dental Hospital, or
Dental Department of a General Hospital, two years.

(*c*) Candidates shall produce Certificates of having received three years' instruction in Mechanical Dentistry from a registered Practioner.

(*d*) The three years of instruction in Mechanical Dentistry, or any part of them, may be taken by the Dental Student either before or after his registration as a Student; but no year of such instruction in Mechanical Dentistry shall be counted as one of the four years of Professional Study unless taken after registration.

(*e*) One year's *bona fide* apprenticeship with a registered Dental Practitioner, after being registered as a Dental Student, may be counted as one of the four years of Professional Study.

The Committee have added as an Appendix the Regulations of the British Dental Licensing Bodies.

RECOMMENDATIONS.

The Committee recommend :—

1. That the attention of the Royal College of Surgeons of Edinburg be called to their Regulation (p. 12), requiring "attendance on the practice of Surgery, and Clinical Lectures on Surgery, at a recognised Hospital . . . . Six Months."

2. That the attention of the Faculty of Physicians and Surgeons of Glasgow be called to their Regulation (p. 13), requiring attendance on "the practice of a recognised Surgical Hospital, with Clinical Instruction, not less than six months.'

JOHN BATTY TUKE.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

The following were the questions in the written portion of the examination for diploma in Dental Surgery, which commenced on the 9th ult.

Anatomy and Physiology and Surgery.

1 to 3 o'clock, P.M.

N.B.—The Candidate is required to answer at least one of the two questions, both on Anatomy and Physiology, and on Surgery and Pathology, unless he is entitled by the Regulations to exemption from any of those subjects.

Anatomy and Physiology.

1. Describe the Fœtal Circulation and the changes which take place in the Circulation after birth.

2. Describe the Pharynx.

Surgery and Pathology.

3. Describe the manner in which an Abscess is formed. Give the symptoms and treatment of an Acute Abscess. What are the physical, chemical, and histological characters of Pus?

4. Describe the different forms of Ulcer met with in the Tongue.

Dental Anatomy and Physiology and Dental Surgery.

5 to 8 o'clock, P.M.

N.B.—The Candidate is required to answer at least two of the three questions, both on Dental Anatomy and Physiology, and on Dental Surgery and Pathology.

Dental Anatomy and Physiology.

1. What deductions as to the relations of the milk and permanent dentitions of Mammalia can be drawn from their development?

Give examples of persistence in the first, and of reduction, or suppression in either series.

2. How would you prepare sections to show:—
   (1) The nerves of the Pulp,
   (2) The Odontoblast Layer,
   (3) The striæ of the Enamel Prisms,
   (4) The Peridental Membrane?

3. What functions are fulfilled by the pulp in a completed tooth?

Dental Surgery and Pathology.

1. What difficulties and irregularities may result from the eruption of teeth in the relative positions which they occupied whilst still within their crypts.

2. Give the considerations which determine the choice between extraction of bicuspids or first molars in cases of crowding. What untoward results may follow the loss of first molars, and how may they be prevented?

3. Discuss immediate root-filling. What conditions of root may exist rendering success in root-filling impossible?

DEATHS FROM CHLOROFORM.

In the Court Room, Town Hall, Stalybridge, on Oct. 20th, an inquest was held before Mr. F. Newton, touching the death on Thursday, Oct. 18, of Miss Mary Isabella Anderson, 19 years of age.

Annie Anderson, of 3, Portland Place, said the deceased was her sister. She had been suffering from neuralgia for two or three years, and had been under the treatment of Dr. Crawshaw for the purpose of the extraction of her teeth by Mr. Morrey, dentist. Her father had consented to the operation. Witness could not form any opinion as to whether she was fit to undergo the administration of the anæsthetic. So far as she could see the chloroform was properly administered.

Mr. Thomas Hill Morrey, dentist, Ashton, said the deceased consulted him with respect to the condition of her teeth, last Friday week. She said she had suffered most acutely for a considerable time. Witness suggested that as there were so many teeth to extract it would be better that it should be done under the influence of chloroform. He asked who her medical attendant was, and she said Dr. Crawshaw. Witness attended at the deceased's residence with Dr. Crawshaw, who administered chloroform. Seven or eight teeth had been extracted by witness when the doctor perceived that her breathing had ceased, and called the attention of witness to the fact. The doctor tried artificial respiration, and did everything he possibly could to restore animation, but without effect. The chloroform was properly administered.

Replying to Mr. John Shaw, witness said he always had a doctor in attendance on such occasions. He did not administer chloroform himself.

The Coroner : It would be a risky and an ill-advised thing to do.

Mr. Shaw : I understand dentists can have a certificate to enable them to do it.

Mr. Samuel Crawshaw, B.M., and M.R.C.S., Trafalgar-square, Ashton, said he had attended the deceased, on and off, for nine years. During the last two years she had suffered from anæmia and neuralgia, the latter arising from the state of her teeth and blood together. Witness recommended her to consult Mr. Morrey, and an appointment was made for 4 p.m., at her residence. Witness made a thorough examination of the deceased, and did not anticipate any evil consequences from the administration of chloroform. He thought it would be a more serious case than usual, but that there was every chance of her pulling through.

The Coroner : Did you notice any special condition of the heart ?

Witness : Nothing more than would be accounted for by the state of her blood.

The Coroner : And general debility ?

Witness : Yes. He got her under the influence of the chloroform and seven teeth had been extracted, when she suddenly stopped breathing. They then lowered her head, and tried artificial respiration. The deceased's heart beat for three or four minutes after she ceased breathing.

The Coroner: Have you come to any conclusion as to the cause of death?

Witness: Cessation of breathing first.

The Coroner: What would that be brought about by?

Witness: It was really the result of the chloroform.

The Coroner: The chloroform would produce a certain effect upon the heart?

Witness: Yes, but in this case the breathing ceased first.

The Coroner: Then you think she did not die from syncope?

Witness: No, from asphyxia. Of course, the heart rapidly failed after the breathing ceased. I have administered chloroform hundreds of times, and in this case I administered it in the usual way.

The Coroner: It would be impossible to foresee this result?

Witness: I carefully thought the matter over, and considered there was a reasonable prospect of success.

Mr. Shaw: Did you consider her in a thoroughly fit condition for the operation.

Witness: She was not in as fit condition as she would have been had her heart been stronger, but it was the best way.

Mr. Shaw: Would it have been advisable to wait?

Witness: We had been waiting for two years. I wanted her to have her teeth extracted two years ago. She was in a better condition two years ago.

The Coronor: Notwithstanding, you thought she was in a fit condition to undergo the administration?

Witness: Yes. There were twenty-two teeth to be extracted.

Mr. C. Bardsley (juryman): Did you call in any other medical man?

Witness: No, there was no time. We were too busy to think about it.

The Coroner: You thought you could do all that was necessary?

Witness: Yes.

The Coroner summed up briefly, stating that if the jury thought the doctor exercised proper discretion their verdict would be one of death from asphyxia, and they could add that in their opinion the chloroform was properly administered.

Mr. A. Campbell (juryman) observed that both the professional men were properly qualified, and were careful and experienced men, and he did not see that they could return any other verdict than the one suggested. The rest of the jury concurred, and a verdict to the effect stated was at once returned.

Mr. T. E. Sampson, the Liverpool coroner, and a jury, inquired into the circumstances attending the death of Ada Mary Lancaster, thirty-seven years of age, wife of Mr. C. H. Lancaster, architect and surveyor, Central chambers, North John-street, and residing at Hoylake, who died on Monday, whilst under the influence of an anæsthetic administered for the purpose of having teeth extracted at the dental establishment of Mr. E. Osborn, 1, Rodney-street, Liverpool.

Mr. Charles Holland Lancaster, husband of the deceased lady said his wife was a perfectly healthy person. On Monday afternoon she went, by appointment, to Mr. Osborn's establishment to have some teeth extracted. Witness was aware that she had arranged to have the operation performed under chloroform. Deceased had successfully undergone a similar operation under chloroform about five years ago. He did not know that she had had any heart trouble.

Mr. Osborn, the dentist, said the deceased had been a patient of his for many years. She took chloroform five years ago, and everything then was satisfactory. With the consent of Mr. Lancaster, he made an appointment with Dr. Larkin. She came at half-past one o'clock. He had previously cautioned her by letter not to take food. She had carried out those instructions. Dr. Larkin came to his (witness's) surgery, and administered the chloroform to the deceased. After six or eight inspirations they noticed a change in her colour. They immediately tried to restore respiration, and failed. The chloroform was administered very skilfully indeed. He had had twenty-seven years' experience, and no fewer than 3,000 cases had come under his care. Artificial respiration, which was tried, did not succeedl There was no operation commenced as far as the surgica part was concerned. The sad event happened in the first stage of administering chloroform.

Dr. Larkin considered the deceased lady to be a very fit and proper person to take chloroform. She told him prior to taking the chloroform that she had been in good health. He asked her the ordinary questions in order to ascertain what her condition of health actually was. She took the chloroform very well indeed; there was perhaps a little more struggling than usually happened with a woman, but nothing much really. She had just about become ready for Mr. Osborn to start with the operation when she suddenly turned pale. They both noticed it. Upon examination witness found there were no heart sounds, and no pulse at all, but she went on breathing for a time. When they saw her turn pale they sent for Mr. Osborn's son, who was upstairs at the time, and then for Dr. Briggs. They persevered in their efforts to restore animation from two o'clock till four o'clock. They kept up artificial respiration for those two hours, but the heart never beat at all. He should think that altogether he used about three drachms of chloroform, which was the usual quantity. He had used the same specimen of chloroform four or five times before, and also once since.

Dr. Briggs said he thought the case was one of those very rare accidents which had occurred in the past and probably would occur again. Three drachms were about the usual quantity. Everything possible was done at the time, but unfortunately without success.

Dr. Chapman, physician and surgeon, Mill-road Infirmary, said that the body of the deceased was brought to the institution named on Monday. In accordance with instructions he made a *post mortem* examination of the body, and found that with the exception of a little kidney mischief, all the organs of the body were healthy. It was his opinion that the heart suddenly ceased to beat when in a condition of contraction, and never resumed its action. He considered that she was a proper subject for the administration of chloroform.

The Coroner, in reviewing the case for the benefit of the jury, expressed regret at the sad event, and sympathy with the bereaved husband and family of five young children. He was sure the jury also sympathised with them.

The finding of the jury was that death was the result of misadventure, ond they added that chloroform had been skilfully administered, and that nothing could have been done which had not been done.

CHARGE OF EMBEZZLEMENT.

Robert Henry Hewer, described as a dentist, surrendered to his bail, charged with having embezzled the sum of 10s. and other sums of money amounting altogether to the sum of £1 17s 6d, received by him for and on account of his employer, George Walter Thompson, of the Scottish Dental Supply Association, Henry Street, Carlisle.

Mr. Sewell prosecuted, and Mr. Broughton appeared for the defence.

Mr. Sewell, in opening the case, said that since the proceedings a week before, he had given Mr. Broughton notice that they intended to further charge the prisoner with embezzling £2 15s. on the 20th August, £3 on the 2nd October, and £2 on the 15th October. Other defalcations had since been discovered. The prisoner was one of the local representatives of the Scottish Dental Supply Association, and the allegation was that he had failed to account for sums of money which he had received on behalf of the association. Defalcations amounting to £18 7s. 6d. had been discovered in the week which the prosecution had had at their disposal to work up the case.

Miss Thompson, St. Helens Tannery, Cockermouth, was called and stated that she purchased a set of teeth from the defendant and paid him £3, receiving the receipt produced from him. It was signed by the prisoner, "p.p. the Scottish Dental Supply Association."

Thomas Robinson, tanner, St. Helens, Cockermouth, said he obtained two sets of teeth from the prisoner, and paid him £3 and £2 for them, and received receipts for them.

Miss Annie Charteris, of Glenlair, Dalbeattie, stated that she paid the prisoner 10s. for extracting her teeth, and £2 2s for a new set. She received a receipt for £2 2s.

Mr. Sewell said the £2 2s. had been accounted for, but not the 10s.

Margaret Pepper, 9, Gatey's Yard, Keswick, deposed that she purchased a set of teeth from the prisoner for 25s. and received a receipt from him, "p.p. the Scottish Dental Supply Association.

Sarah Price, Derwent Lodge, Keswick, said she paid the prisoner 5s. for extracting some teeth.

George Walter Thompson, the prosecutor, said he was one of the proprietors of the Association, and took the management of the commercial side of the business. The prisoner entered their employment in May, and was dismissed on November 3rd. He was paid by cheques. The prisoner had no authority to take private orders. His duties were to visit country branches and take orders, and enter all receipts and payments in the book produced. He had to account for the money he received from day to day. The following sums which the prisoner received had not been accounted for :—Miss Thompson £3 ; Mr. Robinson, £5 : and Miss Charteris 10s. The 5s. which Miss Price paid was entered as 2s. 6d. and the 25s. received from Mrs. Pepper as 20s. In cross-examination, the witness said he was a manufacturer of artificial teeth. Mr. Broughton asked him if he was not a clerk in a rope works, but the witness refused to answer the question and asked Mr. Broughton not to attempt to browbeat him. The prisoner was employed by Mr. Bellas, who was originally one of the members of the Association, but he was engaged on witness's behalf, and he was his servant. It was not the practice of his assistants to take private orders, but he knew it had been done.

Detective Sergeant Keep having given evidence as to the arrest of the prisoner, Mr. Broughton took an objection to the jurisdiction of the Bench, on the ground that all the sums of money were received by the prisoner outside the city, but the clerk ruled that the fact that the prisoner had to pay the money into the bank at Carlisle was sufficient to give the magistrates jurisdiction.

Mr. Broughton said no intention to defraud had been proved, and the mere fact that the man had not accounted for money which he had received was not sufficient to justify his conviction for embezzlement. All his client had done was to take private orders. It was foolishness on his part to give two of the receipts in the name of the Association, but they were not trying the prisoner for being foolish or indiscreet. They were there to answer a criminal charge, and he submitted that there was no evidence to justify it. The proper course for the Association to have taken was to have commenced an action in the County Court, but they dare not do so, as they were afraid of exposing their own business, not being Registered dentists. This was merely a question of account.

The Bench committed the prisoner for trial at the Quarter Sessions, and admitted him to bail, himself in £50, and two sureties of £25 each.

[We do not find any of the names mentioned in this case appearing in the Dentist's Register.—Ed.]

ROYAL COLLEGE OF SURGEONS IN IRELAND.

Dental Examination.

Mr. F. E. Davies, (Dublin) having passed the necessary examination has been admitted a Licentiate in Dental Surgery of the College.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents]

IRREGULAR PRACTICE.

To the Editor of the "British Journal of Dental Science."

Sir,—I desire to ask your correspondent "Nemesis" why he would like to put the very disagreeable work of stopping Quack Dentists from practising upon the shoulders of the Dental Supply Companies?

The idea is most impracticable at first glance that the Dental Companies should have anything to do in the matter. This may surprise the friend of the people, that I should be so radically different in my opinions in this plan he suggests; but does he stop to consider how many really good customers the Companies must refuse should the plan referred to be adopted? That the people need protection from the class of men who are not registered, or better expressed, without qualification, is evident by what we constantly observe in London, without going into the villages to see the work of the charlatan. That something should be done I quite agree, to save the people from the hands of the class who operate in any manner for the one desired object of gain.

It cannot be denied that the law, respecting the registration of dentists is deficient in the extreme, as regards protection for the people; and while it remains as it now reads, your correspondent may appeal in vain to any and all, except the General Medical Council or Parliament either of the latter amending the present law, so it shall make it illegal for any man or woman to practise dentistry unless registered, under penalty of prosecution, and fines in the first two offences, and imprisonment in the third, would soon prevent the practices which now we have cause to complain of, for then it would be possible for one to individually prosecute and gain his case, or better, institute Societies for the express purpose of prosecuting these rankest offenders against the law and people for then it would be of the former as well as the latter, whereas they now offend not the law, but subject the people to suffering, and for this deprive them of the money they can ill afford, providing they received in turn the best of services instead of the worst.

In speaking of this amendment referred to above, some months since, with one of the most prominent leaders of the profession, the writer remarked that such was the law in most of the States, and the people were well shielded from this worst type of Charlatan, by the Societies vigorously prosecuting offenders, and the reply was· "We are more fortunate in living in a country where the people are FREE, and not governed by such iron laws as in America." If indeed these are the sentiments of others most interested, we cannot hope for the better protection of the rich or poor.

So much is constantly appearing on this subject, and no one seems to get at the root of the trouble, *i.e.*, the defective law regulating the practice of dentistry which virtually is no law for the people, nor much more for the dentist, except he can secure a debt in a County Court.

I am, dear Sir,
Yours truly,
A DENTIST.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London' W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications : name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only ; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
6. The Journal will be supplied direct from the office on PREPAYMENT of subscription as under :

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GENERAL PATHOLOGY AND SURGERY FOR DENTISTS.

By Edmund W. Roughton, M.D., B.S., (Lond.), F.R.C.S. (Eng.)

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(*Continued from page* 1065.)

INJURIES AND DISEASES OF NERVES.

Wounds. The following are the effects of complete division of a mixed (motor and sensory) nerve such as the ulnar nerve.

1. *Loss of Sensation.* The area of anæsthesia corresponds roughly but not accurately to the anatomical distribution of the nerve below the point of section. It sometimes happens that a part of the area supplied by the wounded nerve retains a feeble power of sensation; this is due to the fact that the nerve below the seat of injury may receive small communicating branches from a neighbouring uninjured nerve.

2. *Loss of Motor power.* The muscles supplied by the nerve below the point of section are immediately paralysed and cannot therefore be contracted at will.

3. *Changes in Temperature.* Immediately after the section of the nerve the parts below become suffused with

blood and consequently hotter by a degree or a degree and a half Fahrenheit. The increase of temperature may last a fortnight or longer. Subsequently the affected parts become colder than natural.

4. *Trophic Changes.* The nutrition of the tissues is under the direct control of the nervous system, consequently after section of a nerve the parts supplied by it suffer from want of trophic nervous influence and undergo various degenerative changes.

(*a*) *The nerve* itself on the distal side of the section undergoes a series of changes known as *Wallerian* degeneration; the myelin breaks up into globules and the axis cylinders disappear so that the sheaths of Schwann are more or less empty. The connective tissue (neurilemma) of the nerve proliferates and eventually shrinks completing the destruction of the proper nerve elements.

(*b*) *The muscles* undergo similar changes, the connective tissue enclosing the fibres proliferates whilst the muscle fibres themselves break up and disappear; the consequence is that the affected muscles shrink and cease to contract when electric currents are passed through them; Faradic contractibility disappears at once, whilst galvanic contractibility after a temporary increase fades away gradually, only ceasing when all the muscular fibres have been destroyed (*reaction of degeneration.*)

(*c*). *The Skin* of the affected area becomes glossy or shiny, or may be subject to various eruptions, or may ulcerate from trivial injuries, or may even slough.

(*d*). *The joints* may become ankylosed or may undergo degenerative changes. There is a well-marked form of joint disease (*Charcot's disease*) which is dependent upon an affection of the spinal cord called *locomotor ataxy.*

Treatment. A divided nerve should be sutured as soon as possible after the injury. If done at once and primary union is secured the functions of the nerve may be restored without any degeneration taking place, but such a fortunate result is very rare. If the case is not seen until some time has elapsed the divided ends must be exposed, a fresh section made, and the ends united by suture. Regeneration will occur in the nerve and muscles unless they have already completely wasted. A year or more may elapse before motion and sensation are completely restored.

NEURITIS. Signifies inflammation of a nerve. It may be due to injury, to cold, or to extension of inflammation from neighbouring parts. It may also occur as a complication of syphilis, lead poisoning, chronic alcoholism, gout, rheumatism, and the specific fevers, especially diphtheria. The inflammatory process occurs mostly in the connective tissue; the proper nerve elements undergoing degeneration similar to that described under wounds of nerves.

Neuritis may affect a single nerve when it is due to a local cause, or may affect many nerves when the cause is a general one, such as alcoholism.

The early symptoms are those of irritation, such as pain and tingling in the parts supplied by the affected nerves. The later symptoms are due to destruction of the nerve and consequent inability to conduct impressions; they closely resemble those due to section of a nerve.

TUMOURS OF NERVES. See Neuromata.

NEURALGIA. When a person suffers from severe pain in the course of a sensory nerve, and the cause of the pain cannot be discovered, it is usual to call the condition neuralgia. It must be clearly understood that neuralgia is not in itself a disease, but it is only a symptom of an undiscovered cause; to make the diagnosis of neuralgia is but to confess one's inability to find out the cause of the pain. Patients (especially females) suffering from toothache, not unfrequently try to persuade themselves that their disease is "neuralgia" with the object of avoiding the unpleasantness of treatment.

The causes of neuralgic pain are (a) impaired general health due to anæmia, debility, malaria, rheumatism, syphilis, gout, chronic lead poisoning, pregnancy, and lactation, and inherited neurotic temperament; and (b) some local condition irritating a sensory nerve, such as neuritis, a carious tooth, pressure on a nerve by a bony tumour or other form of growth, or by inflammatory exudation, such as a gumma or periosteal node, or by a piece of dead bone.

The pain in neuralgia may be slight or extremely severe ; in the latter case it usually comes on suddenly with a kind of shock, and is of a darting, cutting, or tearing character, extending along the course of the affected nerve. The pain is sometimes accompanied by spasm of muscles, heat and redness, a vesicular eruption, or increase of secretion over the affected area. The points where the affected nerve emerges from a bony canal or passes through an opening in the deep fascia are often tender on pressure.

Treatment. Every endeavour must be made to discover the cause of the disease and to remove it by appropriate remedies; thus if the patient be anæmic, iron must be given ; if rheumatic, salicylate of soda ; if gouty, potassium iodide, colchicum or salicylate of soda; if syphilitic, potassium iodide ; if he has suffered from ague, quinine or arsenic, etc. Every possible local cause of pain must be sought for, and it must be remembered that pain in one branch of a nerve may be due to some cause irritating another branch of it, thus a carious or impacted lower wisdom tooth may cause neuralgia of the whole of the fifth nerve, or of a part of it, e.g., ear-ache.

When the cause of the pain cannot be discovered, attempts must be made to alleviate it by local and general analgesics. Among the former may be mentioned belladonna, aconite, veratria, chloroform, the galvanic current, etc., and among the latter opium, morphia, chloral, and bromide of potassium.

Great caution should be exercised in the administration of opium, morphia or chloral lest the patient become addicted to the drug. In severe cases of neuralgia, which do not yield to local or general remedies, it is sometimes justifiable to resort to nerve-stretching or to section or excision of a part of the affected nerve.

DISEASES OF LYMPHATICS.

LYMPHANGITIS is an inflammation of the lymphatic vessels. It is nearly always due to irritation caused by the absorption of septic matter from some portion of the tissues from which the affected vessels derive their lymph. Thus in poisoned wounds of the fingers it is very common to find the lymphatic vessels of the forearm inflamed. The disease may be recognized by the presence of fine red lines running from an inflamed or suppurating sore to the nearest lymphatic glands, which are also inflamed. These red lines are slightly raised above the surface, and are hard and tender to the touch ; the surrounding skin is often œdematous, the body temperature may be raised several degrees, and marked febrile symptoms may occur. The disease usually ends in resolution in about a week or ten days, but it may go on to suppuration. In some cases the poison gets into the general circulation and leads to septicæmia, pyæmia and death. The treatment is the same as that of phlebitis.

OBSTRUCTION OF LYMPHATIC VESSELS may result from their involvement in cicatricial tissue, or from blocking by a parasite called the *filaria sanguinis.* The result is that the parts which should be drained by the blocked vessels become swollen and engorged with lymph. When the obstruction has lasted a long time the connective tissue of the part becomes greatly hypertrophied, producing the condition known as *elephantiasis.*

LYMPHADENITIS is inflammation of lymphatic glands; it may be acute or chronic.

Acute inflammation of lymphatic glands is nearly always the result of the irritation of some poison conveyed to them by the lymphatic vessels. The lymphatic vessels may also be inflamed, but they more often escape, as they allow poisonous particles (bacteria) to pass through them more readily than the lymphatic glands. The secondary inflammation in the glands usually resembles in character that of the primary lesion, from which the poison has been conveyed, thus if the latter be suppurating, an abscess is likely to form in and around the inflamed glands; if, on the other hand, the primary affection be simply an acute inflammation, as in cutaneous erysipelas, the glands may be expected to under resolution without suppurating. When suppuration occurs it may begin either in the gland itself, or in the cellular tissue surrounding it.

The symptoms are simply those of acute inflammation occurring in the situation of a lymphatic gland. The student must avoid making the mistake of diagnosing a swelling as an inflamed gland in a situation where no gland normally exists.

The treatment must be directed to the original source of infection as well as to the inflamed gland itself. In the early stage an attempt must be made to prevent suppuration by applying cold evaporating lotions; if suppuration becomes inevitable it should be hastened by the application of a hot boracic fomentation. When pus has actually formed it should be evacuated by incision. Glandular abscesses should not be allowed to burst spontaneously, as they are often slow in healing, and are apt to degenerate into sinuses.

Chronic Inflammation of lymphatic glands is usually due to some constitutional taint in addition to a local source of irritation; the latter is often so trivial as to escape detection.

The constitutional taint in nearly all cases is the strumous diathesis. The commencement of the glandular disease is usually a simple inflammation, which in a healthy person would subside without leaving any traces. In a strumous ubject the inflamed gland soon becomes the seat of a tubercular deposit which is extremely prone to undergo caseous degeneration. The caseous mass may liquify and be expelled by suppuration, or it may dry up and form a calcareous nodule. The enlarged glands are almost painless, and at first are hard and freely movable. Usually several glands are affected in the same region forming a chain ; this is often seen in the neck. After a variable time the glands become adherent to one another and to the deeper parts, so that they are no longer freely movable ; the skin over them becomes adherent, and of a dusky red or bluish tinge, and finally bursts, giving exit to broken down caseous matter and thin flaky pus. Such abscesses may go on discharging for many months, and when they do heal, are prone to leave ugly puckered scars.

Treatment. This must be both local and constitutional. The latter comprises every means calculated to improve the general health, especially good food, sea air, cod liver oil, iron, and iodine. In the early stages of the disease, local treatment aims at causing absorption of the inflammatory products without suppuration. With this object, tincture of iodine may be painted on the skin, or iodide of lead ointment may be thickly spread on it every night, but these remedies are more often useless than not. When the glands have remained enlarged and hard for a long time, and have refused to yield to local and constitutional remedies it is justifiable to remove them by operation. When suppuration has occurred the pus must be freely evacuated, and the affected gland or glands dissected out if possible ; failing this, all the caseous matter should be scraped away with a sharp spoon ; if any of it is left behind, suppuration will go on until it has been evacuated. The scarring that follows operation is much less unsightly than that which ensues when abscesses are allowed to burst spontaneously.

(*To be continued*).

PACKING DIRECTLY ON THE MODEL.*

By Mr. W. Sunderland.

Mr. President and Gentlemen,—In complying with a request to prepare a paper for this evening, I have chosen for my subject one which I think should be deeply interesting to all who are in any way connected with, or engaged in the practice of Dentistry.

The interest of the subject, rather than any qualification I possess, must be my excuse for dealing with a method of packing vulcanite work, which I am sure would have been dealt with much more creditably by some other member of this Society.

I have ventured to bring the process under your notice, not with the expectation that I shall be able to show you anything new, but with the hope that its introduction will excite discussion and thereby elicit your opinion of the method.

It is not my intention to attempt to describe existing methods of manipulating vulcanite work, but rather to submit for your careful consideration one by which any vulcanite piece can be packed directly on the model.

I have prepared a few specimens of the work, taken at different stages of the process, which will show to you the *modus operandi* more clearly than it is possible for me to describe, but if in attempting to do so, I should fail to convey a correct idea of any part of it, then, I trust you will kindly overlook my short-comings and give me an opportunity to supplement these remarks after I have finished.

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* Read at the Student's Society, National Dental Hospital.

Although it is not absolutely necessary to obtain two models of a mouth for which an artificial piece has to be made, yet to me it is a desideratum to which I have attached considerable importance.

The second model is always taken from the first, and used for the bite, and also for mounting the teeth in wax. The first is used exclusively to pack the rubber on. Since the manner of procedure is slightly different in partial and edentulous cases, I will for the purpose of simplicity assume a plate is to be made where no artificial gum is necessary and where some of the natural organs are represented on the model.

If it is desirable to try the teeth in the mouth, they are set, up on a wax base-plate, and when the fit in the mouth is obtained, the first model is cut in certain places for the reception of the neck of each artificial tooth in order to ensure a close fit to the gum. When clasps are necessary for the retention of the plate, they are adapted to the most suitable teeth and imbedded in the wax plate. Up to this point there is no essential difference, whether for packing in the flask or on the model, only for the latter method the wax need not be trimmed up.

The wax plate carrying the teeth is now firmly fixed to the first model in its proper position, this is easily done by dropping melted wax on the posterior part of the palatal surface of model along the line where the plate terminates. The front part of the model together with all the teeth and clasps are now covered over with plaster, taking care to bring it slightly over the cutting edges of the artificial teeth. This forms a cap which will hold the whole firmly in position. When the plaster cap is quite hard the wax is removed, and the whole placed in front of a gas stove or fire to dry.

It may be as well to mention that the model can be made too dry, in which case the surface is readily rubbed off, at the same time if not dry enough the chloro-rubber will not adhere to its surface.

The success of the whole method depends to a large extent upon having a good solution of chloro-rubber, which is easily obtained by dissolving Whalebone or other rubber in chloroform. This should be made to the consistency of a thin paint.

When the model is dry, a thin coat of the solution is painted on all parts where rubber is to be packed, and left a few minutes until the chloroform has evaporated. After the solution is dry, the whole is ready for packing, and for this purpose suitable pieces of rubber are cut and warmed on a plate over hot water. It is better to fill up all the interstices between the teeth first of all, and afterwards pack round the pins and fill retaining pits, that is when diatoric teeth are used. Some little caution is necessary with regard to the amount of pressure used during the process of packing.

If too much force is applied it might be the means of breaking or misplacing the plaster cap, whereas the same force used in packing in a flask would be perfectly harmless.

However, if small pieces of warm rubber be used, and cut with some regard to the shape of the place they are intended to fill, the cap will be found to be quite strong enough for all practical purposes. When all irregularities are filled in, a pattern should be cut to the size of the plate required. from which a uniform thickness of rubber is cut and adapted to the model in its proper position, care being taken to touch the deepest part of the model first, the object of this being to prevent enclosing air between the two surfaces.

It is impossible to over-estimate the importance of packing just sufficient rubber, that no filing or reducing is necessary when the piece is vulcanized. Cutting or smoothing any part of the rubber is readily done by means of a hot instrument.

The last thing to do before investing in the flask is to cover all the outer surface of the piece with suitable tin foil ; by this, a finished surface is obtained when vulcanized.

Edentulous cases differ only with regard to packing the front or gum part, before enclosing the teeth with a plaster cap, so that when one has become accustomed to manipulate the rubber on palatal surfaces, the front part presents little or no difficulty.

After the teeth have been set up and adjusted to the bite, the wax front is cut away with a warm wax-knife. The teeth are then cleaned and fixed on the model, which has previously been dried and painted in front.

In packing the gum it is advisable to stretch one thickness of Whalebone rubber from one side to the other, that is all round the gum, superficial to this one thickness of pink is generally quite sufficient.

If, however, some contouring is necessary, the bulk of it should be done in Whalebone, for the simple reason that it is lighter and stronger than New Pink.

After the teeth and gum of an edentulous piece are enclosed in a plaster cap, the method of packing is in every respect the same as for partial plates. Both sides having been packed as by the method I have attempted to describe, the whole is inserted in the flask and vulcanized.

When gold or other strengtheners are used it is only necessary to slightly heat the metal and sink it into the rubber, and with a hot instrument trim off the edges.

By this means one can depend upon having the metal strengthener on the surface when vulcanized, as no movement takes place during the latter process.

In my opinion there are many advantages resulting from this method of manipulating vulcanite work, some of which may be enumerated as follows:—

There is less time occupied in packing.

Very little material is wasted.

The teeth are much less liable to move.

The risk of breaking the model and more especially the plaster teeth is reduced to a minimum.

There is little trouble in filing and finishing.

It is cleaner and one can break off the work at any stage. Many more could be cited, but I do not think it necessary to go through them on this occasion.

If these conclusions which I have ventured to draw are not over-strained, and my experience, extending over a considerable number of years, leads me to think they are not, then the method deserves more attention than it has hitherto received.

There are many other points arising out of this subject which ought to be considered, as in cases of difficult repairs, &c., but if I were to enter into it in every detail, more time would be taken up than is intended in a paper of this kind.

As it is, however, I trust you will not consider I have taken up too much of your valuable time by these practical suggestions, and also sincerely hope you will accept them in the spirit in which they are offered.

MUSK DENTIFRICE.

Take of

Camphorated Chalk	2 ozs.
White Castile Soap	3 drms.
Powdered Orris Root	6 ,,
Bicarbonate of Soda	3 ,,
Grain Musk	2 grs.

AFTER-DINNER SPEECH.*

By Sir Walter B. Foster, M.P., M.D., D.C.L.
Parliamentary Secretary to the Local Government Board.

Gentlemen,—The next toast on the List which I have the honour and privilege of proposing is that of the "National Dental Hospital and College." It is an institution that I have looked at for a considerable number of months from the outside, and I have often wondered what went on inside. And during the past few days I have had the opportunity and privilege of observing the hidden mysteries and its useful work of the Institution which is carried on in Great Portland Street. Well now, I have been round that building, and looking at it from the outside I was much struck by it, and still more impressed by its useful work on looking over the interior. Considering the source of that Building, I would say of that Institution, it is a noble gift on the part of a noble lady, (cheers). I was very much struck in the course of my walk through the various departments of the Hospital and College on seeing in certain rooms a row of exceedingly comfortable and enticing chairs, and, in association with those chairs, various appliances for carrying on the profession of dentistry. The chairs were so nicely placed, at such pleasant angles, that one was almost tempted to seat oneself and to feel the experience of an operation, but I luckily escaped giving way to that temptation, and my satisfaction at not giving way was not lessened when in one of the departments I had the opportunity of seeing a senior student do some teeth extractions with great celerity and skill. But when I saw the manner in which he handled the patients, and the ready way in which he extracted teeth, I was forcibly remind ed of my own experience thirty years ago. I remember, when a student at that time, I attempted to extract a tooth from the back of the mouth of an old lady, and I recollect the sensation of that attempt to this day, and if that old woman is alive to this day, I am sure she does too (laughter). That experience of dentistry was sufficient to kill my rising ambition with reference to the extraction of teeth, and I have seldom attempted and seldom attended at the operation of tooth extraction since.

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* Delivered at the Students' Annual Dinner of the National Dental Hospital

But since then you have made great advances. In those times the extraction of teeth was regarded as the beginning and the end of the science of Dentistry. That was so, and it was not, I understand, till long after, that it was held in the large esteem and honour that it is to-day, when the extraction of teeth forms but a small portion of the work you are able to do for your fellow creatures. Since then the students of dentistry have taken their proper place in the professional world. Men admitted to that branch of the profession to which I belong are educated in the sciences of anatomy and physiology and all other branches of knowledge which contribute to make a good practitioner, whether in medicine or dentistry, and when your students follow out these branches of preliminary training, they learn not only theory, but they meet with great success, as has been shown by the facts placed before you as to their position in competition with the students at the Middlesex Hospital, by the Dean, and I hope we shall have more anatomists springing from the ranks of dental surgery.

I need only mention the name of Mr. Tomes to show what has been done in reference to the science of anatomy. Your training is thorough. You are not limited to anatomy, physiology, pathology, or surgery, but you go beyond into the study of surgical appliances, and you have added the architect to other branches of your study, and this special knowledge you are able to apply with great advantage to the community. When I look at the mechanic and remember his power of uniting things, and when I look at the beauty of artificial limbs, I am reminded that you not only remove portions of the body, but that you replace them by something that is superior. I have never seen an artificial leg which could compare with the beauty of the original limb, but I have seen many teeth which exceeded in beauty, and I hope in usefulness, the original organs, (laughter). So I think in this respect the great and older Art of Surgery has something to learn from its younger brother Art of Dentistry. I have also noticed, in my capacity as physician, that dentists have shown great art in winning the confidence of their patients. I have sometimes in an ignorant and stumbling fashion been inclined to criticise things done to my patients by members of your profession, but I have always found the patient on your side. There is no doubt that much is gained through this great skill and tact in winning the confidence of patients. In this connection I remember a story of an old woman who went into a hospital with her husband, who was supposed to be dead, and when the patient had been placed on a couch and examined by the junior surgeon, the surgeon said, "I think he is dead." But the patient opened his eyes, and shook his head as if to contradict the assertion. Raising her hand the wife said "Be quiet, John, the doctor ought to know best," (laughter). That is a very wholesome condition of mind which patients should be encouraged to maintain towards their medical advisers.

But I have had another experience with you in another capacity. One of the first things that came under my cognisance when I became one of Her Majesty's Ministers, was to have placed before me reports about the condition of the teeth of children in certain schools (cheers). When I looked over those documents, full of statistics and peculiar hieroglyphics, I began to wonder at the troubles of a Minister, and whether part of the Local Government Board's responsibility was for the teeth of the rising generation of the nation. But I found from it that you had been looking after the teeth of the children in the Board Schools, and collecting important information, and one of the most remarkable reports was in the case of Hanwell Schools, for which the Dean was largely responsible. That document caused me an hour of unpleasant and difficult reading, and the intention of that report was to show that a large amount of public good can be done by giving proper attention to the teeth of the rising generation, and thereby bringing them up in a way that is likely to make better citizens of them. By attending to their teeth you make them better and stronger than they otherwise would be.

Dr. Cunningham gave me papers with reference to this matter, and from investigations he has made with reference to recruits for the army, and also for the navy, I think I am right in saying that he found that only 5 per cent. of a certain number of these recruits had healthy teeth, and that no less than 61 per cent. had bad teeth.

Now one would not think this was a subject on which rested not only the health of thousands of soldiers and sailors, but almost the supremacy of this great Empire. Gentlemen, believe me when I tell you it is as essential that the soldier should be able to chew, as that he should be able to march, (cheers) for if he cannot chew well, he will not march well or fight well. A man will fight all the better after a good meal if the food is properly assimilated than he will after a badly masticated meal ; so that your profession in relation to the State is an important one, tending to make healthier and stronger men of our soldiers and sailors. I have heard with reference to a training ship from which young persons enter the navy, that, since their teeth have been carefully looked after, the percentage of recruits taken for the Naval Service from that ship was increased six or seven fold. This shows what a large amount of material for the defence of the Empire and for the maintenance of its greatness is possessed by the dental profession.

I therefore congratulate you in having turned your attention to this question of the teeth of the rising generation, and I hope in the Board Schools and in those Schools under Government control you will have opportunities of adding to the health and welfare of the population. In these places I think there is a large field for the practice of your profession.

Although a man puts his name on the doorpost and waits in a back or a front room for patients, they often do not come to him in my profession. I think in your profession he may succeed more rapidly than in mine, and I hope in the meantime you may employ yourselves by carrying on your profession in various public institutions.

There are no hospital appointments or schools except the dental schools in which you can exercise your abilities, but there are Board schools and other public institutions in connection with the various municipalities or School Board districts, in which you may live, in which you may do useful work in looking after the teeth of the children, and I hope all the members will avail themselves of such opportunities as offer of making observations useful to science as well as to the State.

I think also Dr. Cunningham has told you that this is a question not only of physical prowess but of intellectual or mental prowess, and that many a student at Cambridge, which he knows so well, has lost a position in the honours list from bad teeth. I do not understand how any man with an aching tooth, or a bad gumboil, can do a good examination paper.

In another capacity I have referred to your calling. I have referred to it in connection with the position I hold in the medical profession as a physician, and in reference to the position I hold in the Government, and in those connections I have found you doing useful work. And there is another aspect in which I have been brought into contact with you and that is as a member of the Medical Council. I sit there by the votes of the medical profession, and a large number of medical dentists, and I consider myself as owing service and attention to the medical and surgical Art which you represent; and I have endeavoured from time to time to carry out in the Medical Council, as far as possible, the wishes of the dental profession. (cheers). We are responsible on the Medical Council for your registrations. We are also responsible for doing all we can to maintain a high and honourable tone in the profession you practise. I hope the Council has never failed in either of these duties and that we shall be able to keep it pure as regards the names of the men enrolled. I think you have shown a proud and honourable spirit, since you have been registered, to keep the profession as high and noble as it ought to be.

I have been struck by the desire of dentists not to be associated with men who carry on practices not worthy of an honourable calling, and representations have reached the Medical Council from time to time showing that you are very jealous of the profession of dentistry. You cannot be too jealous because in your calling, more than in mine, there are opportunities which a man not animated by a spirit of high professional honour may take advantage of, and you are right in endeavouring to maintain a high standard of honour among your profession, not so much for your own benefit as for the benefit of the public.

People who call out against trade-unionism and professionalism only see one side of the question. The man who is surgeon, dentist, or doctor is trusted very often with some of the interests of his fellow men or fellow sisters; and as he has knowledge on the particular subjects and they have very little, he should be a man not to take advantage of their ignorance, but should do the highest and best work he can in the interest of those who have trusted him. It is necessary to be above suspicion.

The public are suspicious of men not in a high position, and I say to you, do all you can to maintain the high standard of social and general efficiency in your calling, and call upon the Medical Council when you can, to assist you in this work, and if you do, I believe the Council will respond very heartily to your wishes (cheers). You have, so far, in that Council no representative, but that is not the fault of the Medical Council (cheers), I believe it is the fault of the Act of Parliament. Some of these days it is possible you may have a dentist to represent you and your interests. I am sure I see no reason why you should not, but every reason why you should. There ought to be some one to speak in your name, and although that cannot be done at present, I think we may from time to time consult such men as Mr. Tomes and receive information which he, as your representative, would be able to give to the Council when dealing with dental questions. I am sure that any representations that come from you to us as individual members of the Council will have every attention that they ought to have, and no effort will be lacking on our part to carry out your wishes (cheers).

I must say this, that I do not know any body of men who during 10 or 15 years have done more to elevate their calling socially and scientifically. I wish you all success in the honourable aspirations that you have shown, and in the noble efforts you have made to win, and maintain, a good position in the country. I hope, scientifically, socially, and statistically, you may go on doing good work.

I am glad to come here this evening and I esteem it a pleasure to be placed in the position in which you have placed me. I hope every member of this gathering will go away determined to maintain the high position of their calling. (cheers).

Review.

Microphotographs of Dental Histology.

We have received from Dr. CHAS. RÖSE, of Freiburg, and Dr. ALFRED GYSI, of Zurich, the Portfolio of photographs alluded to by Mr. Paul in his recent communication published in the JOURNAL. These photographs, twelve in number, are on enamelled Bromide paper, seven inches square, mounted upon thick cardboard eleven inches by sixteen, and they form a most handsome collection illustrating the normal tooth-tissues. There is a lithographed reproduction of each photograph, with explanatory notes. Those dentists who are interested in the scientific aspects of their profession, and those who are unable to devote the necessary timo to original work, cannot do better than provide themselves with this portfolio. We are quite prepared to find that the whole edition will be taken up readily, and then we may expect from the authors another series dealing with pathological conditions. The cost of the portfolio is twenty-four shillings, exclusive of postage, if ordered before Feb. 1st, 1895, and, to avoid extra expense, Dr. Gysi has undertaken the distribution. We cannot speak too highly of these splendid productions, but we would suggest that they should be called Photomicrographs instead of Microphotographs.

British Journal of Dental Science.

LONDON, DECEMBER 15th, 1894.

THE GENERAL MEDICAL COUNCIL.

A considerable portion of the Session just held by the General Medical Council was occupied by the consideration of penal cases, and several names were removed from the Medical Register. A good deal of time was also spent over the reports of the visitation to, and inspection of, the final examinations. Early in the proceedings a Draft Report was brought up by the Chairman of the Education Committee, dealing with those regulations of the General Medical Council which apply to Dental qualifications. In our last issue we were able to publish the text of the Report and an account of the discussion which took place upon it. It appears that some of the Licensing Bodies did not demand the attendance, by dental candidates, upon the practice of Surgery which the Council thinks necessary. It is difficult to understand how such an oversight has occurred, but doubtless in the future the full twelve months will be required. We shall then have a desirable uniformity in the dental curriculum, and there can be no suggestion that one of the portals to Examination for a diploma is more accessible than another, so far as the curriculum is concerned. The deliberate attempt on the part of the Royal College of Surgeons in Ireland to alter the requirements in Mechanical Dentistry is of such recent date that it needs only to be mentioned in connection with the above episode in order to show the benefit derived from the General Medical Council exercising a sufficiently strict control over the Licensing Authorities.

Whether temporary departures from the Council's requirements be intentional or otherwise, we hold that it is advisable that the recognised curriculum should be the same in all cases. Still further, it is to be hoped that an approach to an uniform standard at the various examinations may be attained. In connection with this view, we receive with satisfaction the announcement that the Council has appointed a Visitor to attend, and report upon, the Dental examinations of all the Bodies granting diplomas in the United Kingdom. This, is, we believe, quite a new departure, and the selection of Mr. CHARLES S. TOMES, F.R.S. for this important duty will be welcomed in all quarters.

By a happy coincidence the annual Students' Dinner of two of the Metropolitan Dental Schools was held whilst the General Medical Council was in Session. In each case a member of the Council was found taking part in the after-dinner speeches. Sir DYCE DUCKWORTH, at the London Dental Hospital gathering, spoke unmistakeably as to the views of the Council in regard to the aspirations of Dentists who wish to elevate the tone of their profession. Of Sir WALTER FOSTER's speech, as Chairman at the National Dental Hospital dinner, we were fortunate enough to receive a full report. His remarks, whether as a Physician, a member of the Government, or as a member of the General Medical Council, will repay perusal. In default of a Dentist upon the Council, we can conceive of no better, certainly no more pleasant, alternative, than the appearance of distinguished members of the Council at Dental Dinners.

IODOFORM AS AN ANTISEPTIC.—Professor Miller of Berlin, and Mr. Mummery, showed at dental meetings a few years ago specimens of bacteria flourishing in the immediate vicinity of iodoform crystals. Several attempts have been made to explain how under such circumstances iodoform gives such good results, clinically, as an antiseptic. Some experiments recently performed by M. Stchegoleff with the staphylococcus seem to throw some light upon the question. This micro-organism flourishes in an iodoformed culture medium, although when inoculated after the action of the drug it is inoffensive. Animals inoculated with the staphylococcus grown in ordinary media suffered with abscesses or died from septicæmia. Two kinds of culture were prepared, one normal, the other mixed with ten per cent. of iodoform. Both were filtered at the end of a week to free them from living organisms, and then rabbits were inoculated with the toxines produced by the organisms and left behind. The animals inoculated with the iodoformed toxine remained well, whereas the others died. The supposition, therefore, is that under the influence of iodoform the toxines of the staphylococcus are converted into non-poisonous iodised componnds.

Rickets and "Honeycombed" Teeth.—In a course of lectures upon the Eye, Mr. Treacher Collins, whilst quoting Mr. Hutchinson to the effect that Rickets has not been proved to affect the permanent teeth, pointed out that it may possibly do so. Those teeth which are most frequently affected are the ones in which calcification commences during the first two years of life, that is, at the time of the initiatory stage of rickets. We believe that Dr. Grevers of Amsterdam is carrying out an investigation as to the etiology of "ridged" incisors and canines, and it will be remembered that we published a paper by Dr. George Carpenter and Mr. Denison Pedley upon the subject of Rickets affecting the Teeth.

Cocaine Poisoning.—A report of some experiments as to the toxic action of cocaine has been presented to the Academy of Medicine in Paris by M. Maurel. The author found that the leucocytes increased in size, became round and rigid, and did not adhere to the vessel walls. The capillaries, however, contract under the action of cocaine and fatal results may be produced by a thrombus or an embolism. This contraction of the small vessels is one of the most marked effects, and, as pulmonary embolism seems to be the occurrence most to be feared, it was thought that injections made into an artery directed away from such an important organ as the lung would be safer than if introduced into a vein. The experiments corroborated this idea as over five grammes of cocaine per kilo. body-weight were injected into a rabbit's femoral artery without causing death. The changes in the leucocytes may be seen even after small doses of a 1 in 10 solution, and show the danger of using concentrated solutions.

Accessory Thyroid Gland.—A case is recorded in the *British Medical Journal* of a tumour at the base of the tongue occurring in a patient at the Throat Hospital. A girl of 17 had her throat examined by her singing-master, who discovered the lump. At the hospital, this was found to be near the foramen cœcum, semi-elastic, immoveable, and of the size of a small walnut. It pressed upon the epiglottis, and when the tongue was pulled out it almost touched the soft palate. Profuse bleeding accompanied its removal by operation, but the wound was healed in ten days. Under the microscope the tumour was found to present the same structure as that of the thyroid gland, and it is stated that such tumours are not infrequently met with in this region, but such a large one projecting into the mouth is almost unknown. "They orginate in connection with the lingual duct, a structure of embryonic significance."

A Germicide.—The investigations of Drs. Abbott and McCormick, of the Johns Hopkins University, show that a solution containing 7 per cent. of acetic acid is more effective as a germicide than bichloride of mercury.

Reports of Societies,

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The usual Monthly Meeting of this Society was held on Friday, November 2nd. W. Rushton, Esq., in the unavoidable absence of the President, who was indisposed, taking the Chair.

The minutes of the previous meeting were read and confirmed, and Messrs. Halliday and Mullord having been balloted for were unanimously elected members of the Society.

CASUAL COMMUNICATIONS.

Mr. **CLARK** said that an Upper Central Tooth which had become greatly discoloured during the process of regulating, last June, had now much improved in colour, and was almost perfect. He thought it a wise plan in such cases, not to be too ready to drill into the pulp chamber, and treat as a dead tooth, but rather wait and see what result could be obtained without resorting to such extreme measures.

Mr. **BEVERLEY** showed an electric lamp for the surgery which could be adjusted to almost any position, and the light concentrated on the patient's mouth only.

Mr. **RUSHTON** showed an Upper Central Incisor with an abnormal development of the cingulum, very much resembling a bicuspid.

Mr. **FARMER** brought forward a section of a tooth from a girl, aged 17 years, which had been extracted owing to pus oozing from the neck of it, but the patient had no pain. When examined under the microscope, it was found to be a whole mass of cementum, dentine, and enamel mixed together

Mr. **NICHOLLS** reported—

(*a*) An interesting case of extensive caries of the root of a tooth, passing considerably below its neck, and with marked absorption at the apical portion. The tooth had been extracted from an elderly woman who had suffered alveolar abscess over the root apex for six years.

(*b*) A student's regulation case in which the left upper bicuspids had had an elastic ligature left on them for three months, owing to a misapprehension on the part of the patient. The elastic band had worked through the gum between the two teeth up to their apices, in such a way as to cause almost complete absorption of their alveoli. The teeth were very loose and pendulous, and the roots were afterwards found to be much denuded of Periosteum. The elastic band could not be removed until extraction was resorted to, after which the teeth were immediately replaced and kept in position with A 1 composition, but it failed to hold them steady. They were then re-inserted with the aid of Truman's Gutta Percha, and the lower jaw fixed up tight with a four-tailed bandage, but five days later the teeth came away, the wound having healed up.

(*c*) A case of a young woman, aged 25 years, who took the gas well until anæsthetised. The face-piece was removed for operation, but the breathing suddenly ceased—the pulse continued. The patient was laid upon the ground, and artificial respiration performed for about three minutes before she recovered. The patient said she had never taken an anæsthetic before, and that she had had repeated attacks of bronchitis, also the influenza three years ago, and at one time an attack of acute rheumatism. The appearance of the patient was pale, but she was not anæmic. She suffered badly at times with palpitation of the heart. There was cardiac dyspnœa, the cardiac area was increased with a very diffused apex beat, and there was a rumbling noise and murmur with each heart sound. The lungs were normal.

The notes of this case were supplied by Dr. Holmes.

Mr. SUNDERLAND then read a paper "Packing directly on the model," which we publish on page 1112.

Messrs. Rushton, Beverley, Greetham, Clark, Farmer and Reeve joined in the discussion which followed, and a hearty vote of thanks having been accorded Mr. Sunderland for his paper the meeting then adjourned.

Dental News.

THE DENTAL HOSPITAL OF LONDON.

The Annual Dinner of the Staff and Past and Present Students was held at the Hotel Metropole on the 1st inst., the Chair being worthily occupied by Mr. S. J. Hutchinson. He was supported by Sir John Williams, Bart., Sir Dyce Duckworth, Sir J. Crichton Browne, Messrs. Christopher Heath, J. Smith Turner, A. Stoneham, Chas. S. Tomes, F.R.S., Howard Mummery, F. Canton, and a very large attendance of Students and Friends of the School. The Toast of the "Past and Present Students" was proposed in an excellent speech by the Chairman who said that £14,000 required for the rebuilding of the hospital remained to be raised. He believed that the addition to the General Medical Council of a representative of the 1,400 qualified dentists in England would add to the usefulness of that body.

Messrs. J. H. Badcock and N. C. Bennett responded.

Sir J. Crichton Browne in proposing "The Hospital and School," also alluded to the efforts being made to build a new Hospital. Criticising in a humourous manner the oft-quoted advice by an eminent Statesman that the number of teeth suggested that thirty-two bites should be given to every morsel of food, Sir James was able to show by a reference to the anatomical articulation of the teeth that the figures might at least be reduced one half.

Mr. Allan Stoneham, the Treasurer of the Hospital, in response, spoke hopefully of the finances of the Institution and of the projected new Building, and Mr. Robert H. Woodhouse gave a good account of the School.

The Toast of the "Visitors" was proposed by Mr. E. Lloyd-Williams and Sir Dyce Duckworth in reply, alluded not only to the honourable status to which the practice of Dental Surgery has attained, but also to the action of the General Medical Council with regard to Dental affairs.

Mr. Charles S. Tomes, F.R.S., proposed the final toast, that of the Chairman, and dealt in a happy vein with his earlier recollections of Mr. Hutchinson, and the many numerous professional and official positions which that gentleman had since occupied.

An excellent Programme of Musical and other items under the direction of Mr. Herbert Schartau added to the enjoyment of a most successful gathering.

NATIONAL DENTAL HOSPITAL.

The Annual Dinner of the Students was held at the Holborn Restaurant, on the 30th ult. Sir Walter Foster, M.P. presided, and among the Visitors present were Sir William MacCormac, Drs. Vivian Poore, S. Coupland, H. R. Spencer, Messrs. S. L. Rymer, H. G. Howse, J. Langton, A. E. Barker, S. J. Hutchinson, F. Canton, J. Smith Turner, &c. After the Loyal Toasts, the Dean (Mr. Spokes) in asking the Chair man to present the Students' Prizes, said that he did not propose to read any formal report as to what had taken place in the School during the past year, but simply to say what had been done by the Students in the way of taking diplomas. They had three gentlemen connected with the School who had taken the diploma at the Royal College of Surgeons in Ireland, one who had been successful at the Faculty in Glasgow, two had passed the first examination in Edinburgh, and one other the first examination in Glasgow. They had ten candidates who went up to the Royal College of Surgeons of England, eight of whom came back with diplomas (cheers), and he had no doubt but that the other two gentlemen would give a good account of themselves before very long. Not only had their Students met with success at the Examination Halls, but also at the General Hospital. In competition with their medical brethren, Mr. H. J. Relph had taken first certificates in Physiology and Practical Physiology, Mr. S. F. Rose second in Anatomy and Practical Physiology, and Mr. A. E. Relph the Prize in Practical Physiology.

The CHAIRMAN then presented the awards as follows :—

Dental Anatomy ...	Medals	J. C. Arnold. H. W. Tice.
	Certificates	T. C. Reece. N. Reeve.
Dental Surgery ...	Medal	S. F. Rose.
	Certificates	N. Reeve. T. G. Jenkin. W. Sunderland.
Dental Mechanics ...	Medal	H. J. Relph.
	Certificate	H. W. Tice.
Dental Metallurgy ...	Medal	J. C. Arnold.
	Certificates	W. Sunderland. E. A. Wheeler.
Dental Materia Medica	Medal	T. C. Reece.
	Certificate	T. G. Jenkin.
Operative Dental Surgery	Medal	E. Fogg.
	Certificate	W. E. Hill.
Histology	Do.	A. E. Relph.
Rymer Gold Medal ...	...	Norman Reeve.
Students' Society Prize	...	Do.
Ash Prize	...	H. J. Relph.

Mr. SPOKES, in calling upon the winner of the Rymer Gold Medal said they had not always at that annual meeting been so fortunate as to have the donor of this medal with them as they had on that occasion (cheers). He came across that day, among the archives of the school some reading which threw light on the institution of the Rymer Gold Medal. Those who were old enough, and were sufficiently well acquainted with the dental facts, would know that before the School was associated with the Hospital, there was a Metropolitan School of Dentistry, and among the papers he had referred to he found a reference to a meeting held in 1863, when Mr. Rymer was the recipient of a Testimonial, and he found that the Rymer Gold Medal was an award which was not presented by Mr. Rymer, but by his colleagues, and he further found that on the last time the award was made before the Metropolitan School of

Dentistry was affiliated with the Hospital, Mr. Rymer said that he wished to be allowed to present to the new School, about to be added to the Hospital, this annual medal of the value of £5 (cheers) for the student who most distinguished himself in general proficiency. He mentioned this piece of history because the donor was present (cheers).

The CHAIRMAN (on the winner of the medal coming forward) said: I congratulate you heartily, Mr. Reeve, on the great distinction you have attained, and I am sure it will be as pleasurable to you as gratifying to every one present, that you should receive this medal from the hands of the donor, who is not only respected as the giver of this gift, but for his honourable associations with the other gentlemen who have received it in past years (cheers).

Mr. RYMER then presented the medal.

The CHAIRMAN next proposed the toast of the evening. His speech is published on page 1117.

The DEAN, in responding, said: Sir Walter Foster and gentlemen,—My colleagues have requested me to respond to this toast which has been proposed by our Chairman, and among the many subjects to which he referred, I must simply select one or two because I recognise the fact I must not attempt to trespass on your time to the same extent as the Chairman might easily do. We are all glad to see that Sir Walter Foster has been able, among his many duties, to find time to take the chair for us this evening (cheers). In responding for my colleagues, I may perhaps be able to make statements, or use expressions, speaking for them collectively, which might appear in somewhat bad taste or not altogether proper if I uttered them as an individual. We are naturally interested in the institution with which we are connected, and as, Sir, you have pointed out, we have now an excellent new building in which the work can be carried on under the best possible circumstances so far as the patients and the operators are concerned. I think we may safely say that in conjunction with other similar institutions, there is a very large amount of good work being done among the poor of London. Perhaps I must not speak too much from a charitable institution point of view because no doubt you expect me to refer more to the school aspect, but the two things are so bound up together. It may be a surprise to those who do not know dental hospitals, that every student on entering is placed under the care of a demonstrator, and passes through a very carefully graded arrangement of operations out of the mouth before he is allowed to see patients in the chair. It must be a great assistance to the student when he enters into practice to feel that as far as possible he has already had before him almost every conceivable case likely to be met with in the course of two years. Of the many subjects to which you referred, Sir, one was with reference to the amount of room. You pointed out that we had still plenty of room, and we believe very much in giving plenty of room, for the benefit of both students and patients. It seems to us only right that we should afford facilities to those from the Continent who make application for our course of instruction. During the past twelve months we have admitted half-a-dozen students from Holland. But it must not be supposed that we do not exercise the greatest care in this respect. Every care is taken to inquire into the circumstances of the students, and to be sure that we are not imparting instruction to some one who will go back and make improper use of it to the detriment of fully qualified practitioners in their own country. Under these circumstances we admit students not only from Holland, but from other places. Another point to which you alluded, and to which we can refer in talking about the School, is as to Dentistry in the Navy. The Director General of the Navy within recent years has taken steps to see that Naval Surgeons know something about dental treatment, so that in the Navy the Jack Tars are treated with a little more respect and consideration than was formerly the case. When a Naval Surgeon has been sent to attend Post Graduate courses in Town, we have been able to provide him with a course of instruction and opportunities for practice. With regard to appointments in Schools in association with our younger practitioners, and remembering your official capacity in connection with the Local Government Board, I would venture to call to your notice that there is a good deal of danger to those appointments in the present unsatisfactory state of things. First of all, I beg to be allowed to correct one of your statements in regard to the Board Schools. We have not yet been able to get a footing in the Board Schools. All our statistics are collected from the parochial or pauper schools, in which the mouths of more than 10,000 children were examined. The results have been tabulated, and on these our information is based. But dental appointments we hope will be made on the same footing as the appointment of medical officers to these schools, with proper inspection by Local Government Board officials, because until some such inspection takes place, there is a great danger of the wrong men getting the appointments, outside men who would accept them for the little *kudos* they would bring, and who would not necessarily do much good work. If the appointments are officially recognized under well-defined regulations of the Local Government Board, such as monthly statements to the House Committee, and annual reports to the Board, and carefully kept records of every operation performed, then I think the appointments will go to the dental practitioners turned out from our Schools well qualified, and in the possession of a diploma. You might safely leave the treatment in the hands of such gentlemen. That is a point, Sir, which I hope may operate in your mind, to influence you in assisting things in a right direction. As a member of the Medical Council we recognise you as a friend at Court, and as holding, to some extent, a brief for the dentists With reference to the present inability to appoint a Dental Representative, as an alternative we can only suggest that to your Committee meetings you should invite that gentleman whose name you have mentioned, and in whom we place the highest confidence, and who, if he had not full powers, could give advice and information at a convenient moment. I feel I have detained you too long, but there are many things left unsaid which one would like to say on such on occasion as this. I conclude by thanking you, Sir WalterFoster, for the kind way in which you alluded to the School, and you, gentlemen, for receiving this toast in the way in which you have. (Cheers.)

Mr. ALDERMAN RYMER then proposed "The Past and Present Students;" He said: Sir Walter Foster and gentlemen,—The Dean has reminded me that so long ago as 1859, he saw by the archives of the National Dental Hospital that I presided at the distribution of prizes to the Students of the Metropolitan Dental School in Cavendish Square. Well that was so, and I presume that it was due to the fact that I have been so long connected with this hospital and the things that led to its establishment, that he did me the honour, and I regard it as a very great honour, to request me to propose the toast of the "Past and Present Students." No doubt this is a most important toast, because the students are the backbone of the educational department of the National Dental Hospital and College, and I should have liked to have seen it proposed by someone more able to do it justice (no, no) than I can, but having regard to the past I ventured to accept the very kind invitation which was made to me. There are but few of us now who were associated with with the educational and Progressive movement of that period but I am happy to note that there are some present with us tonight. There is our old friend and giant in educational matters, Mr. Smith Turner (cheers) present with us who we are delighted to see, and also Mr. Rose, who we are also delighted to see (cheers). Now these gentlemen, and others still living although not present, took great interest in that particular act referred to by the Dean—I allude to the amalgamation of the Metropolitan School of Dental Science with the Odontological Society—it was at that period that we were about to remove from Cavendish Square to premises in Great Portland Street, and it was then that the name of the Metropolitan School of Dental Science was changed to that of the National Dental College. From that period, gentlemen, indeed, from the period of the establishment of the Metropolitan School of Dental Science, many worthy students have turned out splendid practitioners, and many are occupying high positions at the present period. But now with the approved appliances, students improve much more rapidly and there are opportunities of imparting instruction in a much more satisfactory manner,, and hence we have seen turned out from the National Dental Hospital and College a large number of students who are all an honour to the profession at the present time. They have taken part in many public matters. It is an excellent thing for our students to do when they merge into practice to associate themselves with the scientific societies such as the Odontological Society, and the British Dental Association, and thereby further advance the interests of the profession. I am glad to know that many past students of the National Dental Hospital and College, are in the Odontological Society, and the British Dental Association. I have no doubt whatever, that their example will be followed by the present students. I will not say that they can do better than the past students, but if they equal them, I for one shall be perfectly satisfied. I alluded to a period 30 years ago, when I congratulated the then students of the Metropolitan School upon their transference to Great Portland Street. I now congratulate the present students after 30 years—having been spared that long period, and had the gratification of seeing so many of them turn out well—upon being transferred from the old building in Great Portland Street, to the splendid premises placed at their disposal through the munificence of the Lady alluded to by our worthy Chairman. Now with regard to the profession itself. After the eulogium passed by the chairman I need say nothing, but I do certainly entertain a very high opinion of the profession to which we have the honour to belong. I believe in the future it will rank as high as any profession, indeed its status has so improved that at the present time it is an honour to belong to the profession of dental surgery. And there is no doubt that it does much to promote longevity. I have taken a great interest in sanitary matters for the past 35 years (cheers) in the borough of Croydon, which at one time was the most insanitary borough among the 32 largest towns in England, but we have gradually reduced the mortality, till for some time past we have stood at the top of the tree, and that has been due to the attention we have paid to sanitation in which we have had the assistance of the Local Government Board so ably represented by our Chairman. But there are yet means of promoting longevity. In fact people ought not to die of disease at all. (laughter) They ought not to die at all until they die of old age. With our knowledge of what to eat and drink, with improved and improving knowledge of sanitation, and especially when the teeth of the children in the elementary schools are looked after in the way you have suggested, the length of life ought not to be less than 100 years. 1 couple with the toast the names of Mr. Ward and Mr. Fox.

Mr. WARD, in reply, said it was with a good deal of pleasure that he rose to respond to the toast of the "Past and Present Students of the Dental Hospital and College." He had to express their pleasure at being present at that Annual Festival. Were it not for occasions like that, the chances of their meeting each other would be very remote, inasmuch as they did not all practise in the same street. The students could not be too grateful for the kindly treatment always accorded to them by the Staff of the Hospital and College, and for their attention in preparing them to face the examiners. They felt that the foundation of their knowledge was to be traced to the untiring energy of the Staff.

Mr. FOX also responded, and delivered a very humourous address. He said when he was asked to respond for the present Students, he at first hesitated, and he had wished that some one else had undertaken the operation. (Laughter), He had never before undertaken an operation of the kind. He believed when surgeons undertook operations of considerable delicacy they spent the interval of waiting in the study of text-books on the subject. He had been unable to find anything concerning toasts at dinners in any of the students' text-books he possessed, and therefore, at the very outset of his career he was landed in a difficulty. The speaker went on to refer in high terms of praise to the work of the Staff of the hospital. They were under the régime of men who not only told them what to do, but the reasons for doing it. The Students were very proud of the Staff, (cheers) and if they did not get through their career successfully it certainly was not the fault of the Staff (Cheers.)

Mr. RUSHTON next proposed the toast of the "Visitors." He said that Friday had always had the reputation of being an unfortunate day, and he thought that particular day was more unfortunate than most Fridays, for besides being St. Andrew's Day, it was the date of the Anniversary of the Royal Society, and these two celebrations had contributed to deprive them of some distinguished friends. But in spite of this he was glad to say that the ranks of their visitors was as full as ever. He then enumerated the chief visitors present, observing in beginning the list, that they were all glad to see some of their examiners there disguised —in the language of his friend, Mr. Fox—in evening dress (Laughter). The more they knew about the examiners, the more they appreciated them (hear, hear). In Alderman Rymer they welcomed a very old friend, who was well remembered by all of them. Dr. Poore was known to them all as one who took a deep interest in sanitation, and in sanitary matters generally, and they hoped he would turn some of his attention to the sanitation of the mouth.

Professor VIVIAN POORE, in response, said: The gentleman who has proposed this toast enumerated such a long list of distinguished guests that I feel that the responsibility in returning thanks is very great indeed, and I assure you that I feel the honour that has been thrust upon me very highly. It is always a great pleasure to come to a meeting like this, which shows clearly and unmistakably how rapidly the great profession is developing in every branch. Mr. Rymer has referred to the time when men shall not die of disease, but shall live to be a hundred years old. When such a prophecy as that is made, one is tempted to think that the Profession of Medicine is no longer wanted. But "there is a divinity which shapes our ends rough-hew them as we may," and in spite of the efforts of preventive medicine, in spite of the Local Government Board, with which you, Sir Walter Foster, are associated, public health goes on, and doctors increase in number. And it is a very curious thing, if you go to health resorts—so-called health resorts—you find that every second house is a druggist's shop (laughter). In spite of preventive medicine the number of doctors increases out of all proportion to the population, and if you come to a meeting like this, you must come to the conclusion that London is a place where sickness goes on, and teeth decay. There are some who think that specialism in the Medical Profession has gone totoo great a length,but with regard to the specialism of dentistry, there cannot be two opinions. I have never heard an adverse, opinion expressed. It is thoroughly legitimate, and further than that, all are drawn towards it, and feel kindly towards it, because all of us, I suppose, have passed through the fire of dentistry—perhaps as patients, perhaps as operators. Dr. Poore concluded with a humourous account of his experience as an operator, which caused much laughter.

Mr. SMITH TURNER also responded. He said: Sir Walter Foster, and Gentlemen, we all look upon the National Dental Hospital as occupying a very prominent place, and a very important position in the field of dental education. Now this matter of dental education is rather a hobby of mine, but you need not be alarmed, I am not going to make a long speech about it to-night. Dental Hospitals are an established fact.

But dental education, unlike medical education, which is very old, is comparatively young, and it still has to bear the storming about which the mental activity of the present age seems to bring upon all matters of education, from the School Board upwards, and although dental hospitals are established, dental education is not yet what we should like to see it. Despite what has been done by the Medical Council, we have many questions in reference to dental education which demand your most serious attention, the attention of all those who wish well to the Dental Profession, and who wish that the public may be well served by the dentists. What the outcome of these questions may be I cannot tell, it is hard to speculate on such a matter. But on one point I am very sure, and that is, that unless the Medical Council sets a hard face against all efforts made by different people in different places on the plea of hardship, or some other kind of plea, to be placed on the dental Register, our efforts will be in vain. The present tendency among us is to enlarge our curriculum and make our examinations more stringent, but that of itself will not do, if men are admitted to the Register who are not qualified as we desire they should be qualified. That is a most serious question, and I commend it to our illustrious Chairman, knowing that he, above all men on the Medical Council has been foremost in maintaining the necessity of dental education. I think, sir, that it is unwise of the Medical Council to receive any certificates from any Colleges where they cannot direct a thorough investigation as to the merits of these certificates. It is all very well for the Medical Council to do as happily as they have done now, sent out assessors to see that the examinations in the country are carefully conducted, but if they cannot go beyond that, if they receive certificates from institutions that are quite beyond their ken, and if they receive certificates that they do not know have been preceded by a proper preliminary examination, they are doing harm to the Dental Profession and to the public. I think we are greatly indebted in many ways to the Medical Council, but they require to be moved and moved in a gentle and gentlemanly way, and when we have men on that Council who are ready to back us up, it is our duty as far as possible to back them up. What I have stated is, I think, a matter of great importance. We were told two years, or two and a half years, ago by the Medical Council, when we appealed to them to appoint assessors in reference to our examinations, that they had no power to do it. Well, I did not know where the lack of power lay, whether in the Medical Council or the authority they possessed. I believed they had ample power in the Dental Act for the appointment of assessors, and I was extremely surprised to hear that they had not the power. However, the matter was greatly pressed by our friends on the Council and, strange to say, they found they had power, and I am glad to know that they have an assessor to go round and assess our various examinations, and that is a point gained that is obviously for our welfare. Another point that has been alluded to by our Chairman is, that we should be represented on the Medical Council. I had sent to me the codification of the requirements for the dental examinations by the different Colleges, and I read with surprise, and a certain amount of regret, the discussion when the code was presented to the Medical Council by the Business Committee. One member after another expressed his ignorance on the subject. Now, Sir if a member of the Medical Council had been a dentist, there need not have been ignorance on these matters for five minutes, nor need they have run into the mistakes that they have. But with all these mistakes, gentlemen, the Medical Council have done well for us, (cheers) and I hope they will do better, and I hope also that we shall soon have a responsible member on the Medical Council, who will be able to give information when it is wanted, when any discussion may arise on dental matters. I hope that Sir Walter Foster will excuse me saying these things when he is in the Chair, but I know he is tolerant of discussion and expressions of opinion. He and I take great interest in your hospital. I am delighted to see it flourishing, and I hope that it will continue to flourish.

Dr. CUNNINGHAM proposed the final toast, that of ' 'The Chairman" After relating a very amusing story exemplifying the poor opinion in which the dental profession was at the time held, he said it was no longer regarded, except perhaps by a very limited number of the community, as a poor and despised profession. He then made reference to a cartoon of, and an article on, Sir Walter Foster, in a recent issue of *Vanity Fair*, and paid a very high tribute to that gentleman's ability as a politician, administrator and physician. He also congratulated Sir Walter, observing that he was at the same time congratulating themselves, on that gentleman's promotion to ministerial rank.

The CHAIRMAN in response said: You have made it difficult for me to thank you in any terms that would be adequate for the kindly manner in which my health has been proposed, and for the exceedingly generous way in which you have received the toast. I have come to other dinners before this, and I must say without flattery and from my heart, that I have seldom enjoyed on any public occasion a pleasanter evening. I have heard I think, at no public meeting, such exceedingly interesting subjects so amusingly put before an audience and so heartily appreciated by everyone present, and I must say I have learned a good deal about your branch of the profession this evening, conveyed in such a pleasant way, that if it is carried out in your class-rooms, would almost make me wish to be a dental student myself. I hope I may have the pleasure and privilege of being with you on future occasions and if you let me sit at a lower table and listen instead of presiding, I shall enjoy it quite as much. But in any capacity I hope to be at your service. I hope to be able to serve you in the ministry, and, as representing to some extent dentistry, on the Medical Council, (cheers).

A programme of songs and recitations, in which Mr. ALFRED SMITH and some of the Students took part, formed an enjoyable feature of the evening's proceedings.

THE EDINBURGH DENTAL STUDENTS' SOCIETY.

The first of an intended series of Smoking Concerts was held on the evening of Friday, November the 9th, in the Imperial Hotel, the Chairmen being Mr. W. Bowman Macleod, then Dr. William Craig, the hon. Pres. of the Society, and afterwards Mr. Herbert B. Ezard, L.D.S.

At the outset the Dean congratulated the students in having as directors of the Hospital, the elected Lord Provost of that day, and the new Baillie, Councillor Kenioch - Anderson. Hitherto the " Socials " have always been a pronounced success, and the present was no exception to the rule, as the Society were fortunate in having the assistance of quite an array of lay talent. The students, however, contributed the larger portion of the programme, and it became somewhat difficult at times to subdue the enthusiastic encoring,as the students found unknown qualities in their Hospital companions. Of the students it would be invidious to criticise individually, where all were alike excellent; the vocalists being Messrs. R. Carr, J. W. Horne, S. Swales, C. Smart, A. B. Maclean, J. A. Shiach, and J. W. Bell, and the instrumentalists, Messrs. J. Morris Stewart (*mandoline*) Mr. J. Hardie (*cello*) Mr. Gilbert (*violin*) and Mr. Daish (*piano*). Of the lay talent Mr. Imrie's recitations, Mr. J. A. Ellul's dramatic rendering of his well-sung songs, Mr. W. W. Macfarlane's latest humours, and Dr. Macdonald Brown's stories were thoroughly and deservedly appreciated by an audience of nearly one hundred and fifty.

APPOINTMENT.

J. A. Woods, L.D.S., Eng., has been appointed House Surgeon to the Liverpool Dental Hospital, vice L. J. Osborn resigned.

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